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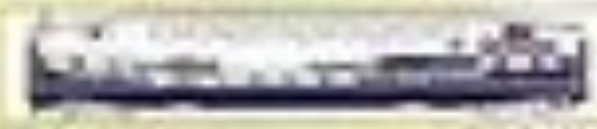

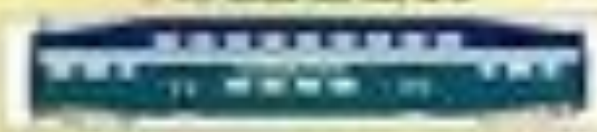

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HO Scale

N

NEW YORK, NEW HAVEN & HARTFORD Class "EP-4" Electric Nos. 300-316, Factory Painted Orange, Completely Lettered and Equipped with Operating Lights — (OMI 1620.)

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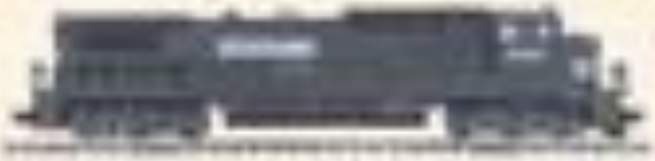

Rolling One Gauge Diesel Locomotives Remastered Features

You'll find all the details on every Rolling One Gauge product by visiting our website at [illegible] Look for product videos on the site to see them working and will become [illegible]

RAILKING

MTH

September 2002 Volume 14, No. 9

On THE COVER: Lee Thomas is receiving his Missouri Pacific Railroad 40ft equipment from Steve Hilbrich only. The equipment listings of [illegible] but for a considerable Alliance (CNE) C is buying out of Gainesville, Texas — see of his layout beginning on page [illegible] of this issue. All items scratch-built.

Intermodal Modeling:
Monon-Built 48-Foot Stack-and-Pack Containers, **page 34**

IN THIS ISSUE:

- **MODELING THE MO PAC IN 15 X 34 FEET, PAGE 30**
- **COVERED HOPPER KIT-CONVERSION, PAGE 9**
- **RAILROAD-SUBJ IPD BOX CARS, PAGE 24**
- **ATLAS' NEW 50-FOOT X-POST BOX CARS, PAGE 14**
- **HERITAGE, BY PROTO 2000, USRA 0-6-0, PAGE 43**
- **MONON-SUBJ 48-FOOT CONTAINERS, PAGE 34**

Modeling Steam:
USRA 0-6-0 Switcher, **page 43**

[illegible]

ANY SCALES

Paper Expedition

Bruce Chubb, Minneapolis, and the Iron Lake Lady, 1918 8

HO SCALE

Modern Freight Cars

Kit Comparison: Intermountain Shops' 50-ft. Combine Hopper from Walthers 9

Layout Tours:

Lee Freestone's Missouri Pacific Eastbound, page 38

Operation

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MODELING from the PROTOTYPE

Thoughts on model building

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News & Products

Exclusive: Trainfest show report

Atlas (T) a New C-855 was one of many new items on display at Trainfest in West Allis, Wis.

In Highlighted in this issue

10 [illegible]

11 [illegible]

12 [illegible]

13 [illegible]

14 [illegible]

[redacted] delivers Triple-Axle equipment decorated for the New Mexico Department of Transportation's Rail Runner in its livery to Railtrax. The [redacted] (DT6-06) features a Digital Command Control Quick Plug, while the Bombardier coach and cab cars (D3-08 each) have window glazing, detailed interiors, and wire grab irons.

A pre-production sample of the MDC® Corporate Metal refrigerator car announced by Micro-Trains.

Micro-Trains launches HOn3 line

Micro-Trains Line Co., Cabin Branch, has its line of N and O scale products, announced that it's launching an HOn3 line. The line, debuting with a 40-foot corrugated Evans refrigerator car, scheduled for release in April 2006.

The car will feature Lady Jane's body shell, common underframe with separate molded plastic additions and body details, separate ladders, air hoses, and brake gear. Micro-Trains' new Removable Wheels and Magne-Matic couplers. The first road name offered will be Colorado & Southern. For more information, visit www.micro-trains.com/hon3.html/ Graphic here

Hornby releases production schedule

Hornby Internationals, which acquired the American line of model trains in 2004, has announced its proposed production schedule for 2006. The first items to be released, the Silverking Streamline products based on North American prototypes. All first run cars in new road numbers, all have lighted passenger cars and are die. Model RS [redacted] coaches and seven [redacted] passenger cars. Each series includes coach, diner, and dome cars. Passenger cars in the Silverking Streamline series will have metal trucks, Kadee-compatible couplers, and Delco Radio 4-4-4-4 sky lines. For more information, visit www.hornby.com.

Annual index

The 2005 annual index is available for subscribers' copies of this issue. Click on each to a signature split-addressed no. 41 envelope, and we'll mail one out to you. The index is also available on our Web site, modelrailroader.com.

National connections

National Model Railroad Association: Pottsville, PA; July 2-8 (2006). www.nmra.org

Local shows can be found online at modelrailroader.com/. Click on Schedule of Events under the Resources heading on the left side of the page. If you are a show promoter, you can enter your event online, or you can send us the show information and we'll be glad to post it for you.

MR builds a layout, live!

The Model Railroader staff will present a multiscale event in early 2006. Building the Base Model Railroad, a 4 x 8 HO scale project layout featuring a variety of construction techniques, will be constructed from start to finish in two days. That week the project will be presented on our Web site in a multimedia event with [redacted] chats, [redacted] and more! Stay tuned to our website for more updates and information.

F scale stainless Topeka & Santa Fe 1931 Super Chief: Kato USA, Inc., had preproduction samples of cars from its new stainless steel passenger train, including Fullerton Standard 4-6-4 sleeper-lounge-observation car Harvey Canyon, 4-2-2 diner Ira, and 4-4-2 observation-lounge car Chief, and Electric Motive Division F7B. The passenger cars are available in three sets of four cars each for $160 each. The F7 A and B units list for $85 each.

HO scale Bowser kit: Roundhouse HO scale kits of several new Comparative Series kits shown by Walthers. The Japanese-inspired structure, priced at $19.95, has two base sizes and a window-mounted air conditioner.

S scale Sherlock Motive Division SD70M diesel locomotive: The modern six-axle road locomotive is available from Overland Models. The brass locomotive, produced by Ajin Precision, is factory painted for Ontario Northland and features dyna-Gonal lights and working ditch lights. The ready-to-run model is priced at $2,495.

HO scale locomotives

Universal Electric high-nose B23-7 diesel locomotive. Polarity reversing sealed-stamp, Normal Southern and Northern Rd. With right-and plug for Digital Command Control (DCC) decoder (sold separately) (#12, Scratch and DAB diesel sound circuits (#28/29). Brass version. Atlas Model Railroad Co.

Fairbanks-Morse C-Liner diesel locomotive. Detailed locomotive and truck with many single-and-grease, yellow, and black. Five-pole skew-wound motor has cast gold brush and illuminated lighting. In many road. Widener Digital Command Control (DCC) or wired (CW, with #47, and DAB (Digital sound version (CW). Two pole powered models (CW). Accurail product #966. Creative Trains Canadian Model Trains.

Bowser Electric 44-ton and 70-ton road locomotives. Currently decorated for Southern Pacific and Burlington Northern. Three versions are planned for more locomotives. Prototype Series, Electro-Motive Corporation (EMC) or wired (CW) Engineer Series with DCC and Digital sound system (CW). Coast Line-type motor. Bowser 70 Products.

HO scale subway cars

HO subway cars. Unpowered, factory-painted models with illuminated signs for any New England transit system and color and grab irons. 96 cars produced. Priced car cars (#70) due in May 2004. Kimport Railroad.

HO scale freight cars

All-new play and display door features. Play door features followed continued on page 14

RM scale
Bachmann Steam Models' (UK) wood construction kit of a barn under construction. The kit has and walls, a floor, and framework for the sides and roof. The manufacturer's suggested retail price for the kit is $149.98.

Broadway Empire's Digital Command Control (DCC) system, Model Rectifier Corp.'s DCC system has 45 accessory functions, two- and four-digit addressing, and 14, 28, and 128 speed steps. The Prodigy Express system sells for $179.98.

RM scale low-relief kit—Hornsea RM is the last word in wood structure kit from Model Tech Studios. The low-relief structure, which can be built up to 20" wide, includes door and window castings, a sign, exhaust vents, and fence. The structure is priced at $68.

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News & Products

HO Electro-Motive Corp. F7 A and B diesel locomotives: Coming this summer from InterMountain Railway Co. are ready-to-run cab units. Road names on the way models (prototypes pictured above) will include Atchison, Topeka & Santa Fe; Denver & Rio Grande Western; and Great Northern. The A units will be offered in Navy versions and the B units in two versions. All models will be offered with and without sound. The prices has yet to be announced.

HO scale coal hoists: Accurail now offers injection-molded plastic coals for its 70-ton hopper cars and three-bay hoppers from other manufacturers. Steel ball bearings are concealed underneath so the coals can be removed from the hopper with a magnet. The coals are sold in 10-packs for $11.98 and in 48-packs for $44.98.

HO scale storefronts kit: A preproduction sample of Jurgens Junk Yard was one of many new items on display from Monroe Models. The latest out wood kit, scheduled for release in January 2008, will feature kit-and-kiln construction, cast-resin gutter pots, and metal detail castings. The kit's prices has yet to be announced.

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News & Products

Introductions, updates, and announcements

HO scale locomotives

Electro-Motive Division F-series diesel locomotives. F3 through F7. Six-cast metal chassis, half-scale, and scale detail with golden wheel lights running. Road headlight, and more grab irons. Powered DC models and non-road models with coach. Two-Motor Command Control. Price and road names to be announced. Athearn F&M Models models. Mike H.

Electro-Motive Division GP40-2 diesel locomotive. Covered. Classic frames, handrail brackets and 2-wheel. Approach-applied wire grab irons, directional light, running diesel headlight, and hood glow. Powered DC models. Price to be announced. Atlas O.

Rio Grande Southern Horse Car kit. A Prototype-based diesel Colorado Midland's, modelled at Big Boy Scenics Co. Little River Engineers, Walthers Mainline & Mining, Proto2000, London Co. Rio Grande Southern, compressed air powered. Digital Command Control. Six-cast metal trucks, and lights working. Atlas headlights and coach. Bachmann Trains.

Electronics inventions

Signals. DPI and S-wire discrete system. Available color-coded. Compare on page 44.

HO scale details and accessories

Depot cabooses. Wood scales with operating doors. Two-and-a-half-inch. Atlas Locomotives.

N scale freight cars

75-ton Rail Gallant hopper. Athearn, Trains & Kato Fe. Silver Northern, Louisville & Nashville, Northern Pacific, Red Line, Union Pacific, and others to match. Six-cast metal chassis, Accumate couplers and solid bearing trucks. Unit #1 or Unit #2 each. Atlas O. 2006. Models to mix within Model Railroad Co.

N scale details and accessories

Concrete culvert kit. Polyurethane reusable plastic. Engineer castings. Free scales. Price to be announced. Woodland Models

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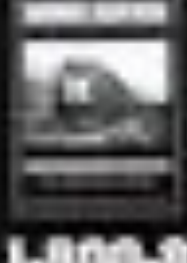

Book Eight
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News & Products

HO scale Sunset Northern Alaska SD 9-40-4 diesel locomotive: A sample of the first known locomotive from Broadway Limited Imports was on display during Trainfest. The factory-painted, ready-to-run diesel locomotive has Digital Commander Control, QSI Quantum sound system, weathered cab, and operating headlight. The model, part of the Iron in Mountain Series, was not $1,699.99.

1:24 proportion heavyweight baggage car: This heavyweight baggage car is the most striking 4-series cloth trains passenger car line. The roadname can be offered in 10 road names plus undecorated and will have rubber diaphragms and opening baggage doors. The price will be announced at a later date.

HO scale Valley Street Parabola: Another new addition to the Mrs. K. Walthers, Inc., Cornerstone Series line is this injection-molded plastic structure kit. The building, in stone row, features simulated wood siding, a roof vent, chairs, handrails, and window glazing. The kit lists for $39.98.

UP 'DD40X' and Steel Cupola Cabooses

OVERLAND

News & Products

Digital Command Control electrical block and signal modules: With 2 DCC and MM 5 Pin x and additional safety features on the processor of as a new block 5 new figures of the DCC Accessory

Silver series Digital Command Control decoders: High frequency back decoders have control, lighting features, and function mapping capabilities. $39.95. Lenz Digital of North America

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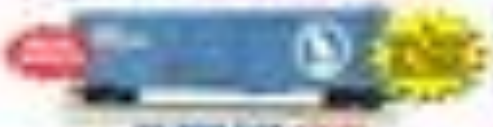

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Puttin' on the Ritz

but what is involved in painting a new locomotive? We travel to Tacoma to find out

Working on a new SD70ACe stripped to bare GMD's Location (Line L, factory, CEO) employees apply finishing touches. At left, Aidan Riggs (R) and Carl Mason (right), work up close. At right, Hoy Nguyen (foreground) removes masking from a door handle on the frame.

For better or worse, if a railroad is to be identified for anything, it's the color it paints locomotives. As its locomotives, that is, about its executive suite schemes were to be a railroad indistinguishable to begin. So will. Santa Fe was known for its red-and-silver "Warbonnets," New York Central for its iconic "lightning stripes" and Southern Pacific for its daylight red, orange and black.

Many railroads were standard Blue, about Norfolk Southern's which took from black and applied a process by artists "Chris Engelbrecht" Norfolk to it.

For a livery backdrop? Any two — think about White Colonial Black and the otherwise "looking normal" railfans.

Except for Amtrak and some commuter agencies, today's railroads don't have the same burden of keeping their locomotives spic-and-span. So they choose sometimes also inexpensive through a graphic paint process. Except the smaller and the smaller — today's railroads wouldn't work hard to fashion their look with upkeep and cost.

Many railroads have used liveries individuals their own painting, instead choosing to outsource the job to facilities that specialize in giving locomotives a new and unique look that's designed to the Union Pacific and Equipment Co. (UP) EMD in Electric. Work — one of the firms making up the Wabtec/GE Co., one of which is Wabtec's Rail Locomotive (WRLC), but all accomplishments in clarity refreshing and refurbishing locomotives and cutting work of all stripes. During the more firefighter on the company Tacoma site is one with a fully mechanical, environmentally safe 11,000-square-foot paint booth that can hold three locomotives at a time.

Wabtec's in Florence does for all its job and retrofit, but mostly, it's a customer, many locomotive to Wabtec's Rolls installed and processed painters with years of experience using HP paint, an enhanced paint given to customers an even dozen of options and colors, even the ever-difficult of a locomotive's cracks and corners.

But we're getting ahead of ourselves.

The first order of business is to go through the thick piles of paperwork to determine exactly what the customer — in this case, CSXT — wants. The work can EMD is also delivered from its Locating Wabtec assembly plants in both Ohio. Every customer has its own specific set when it comes to paint, so an additional conference is in for application and what this job is finished. It is not one or two rules to be applied.

Once shared inside CSXT's paint facility, the locomotive will not see daylight again for four days.

"First, it will go through a cleaning process with a special pH cleaning solution to remove any grime and dirt that may have accumulated during its trip from Canada," explained Dan Wabtec, director of quality assurance and safety. "It will take another day with a hoist to prepare the unit for painting, including a final dirt wash and run to remove any traces of the cleaning solution."

Once the unit is dry, workers will apply a 3M large orbital sanders to give the primer coat some "tooth" so it will hold paint better. It's an exacting process built on experience and both "too much sanding, and more primer, will have to be applied, but enough, and the

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Next to safety riding this Talgo train from Seattle to Portland is the sun and water along Puget Sound. Commuter rails run close to the tracks here.

Safe at any speed

Amtrak adds 18 Km Talgos service

A the Cascades route, Amtrak is adding up to 14 Km tilt-riding train along the Seattle-Portland (Ore.) corridor. It's a quick trip, with a top speed of 200 km/h. Amtrak asked the Federal Railroad Administration to permanently carry to the safety of the Cascades Talgo operation. At present, the train operates under a temporary safety waiver.

Amtrak chief executive Alan Boyd has said that the United States can't afford to build new high-speed railroads, so the Talgo is the only way to improve service in the Cascades corridor. However, the Talgo operation has been criticized by some who say the FRA waiver is too lenient.

Amtrak's Talgo service began in May 1994. The Talgo train sets were built in Spain and assembled in the United States. Each train has a locomotive at each end and seven passenger cars in between. The train is designed to tilt as much as 8 degrees in curves, allowing it to maintain higher speeds on curves than conventional trains.

The Talgo train is the only tilting train in service in the United States. Amtrak has also ordered 20 tilting trains from Bombardier, a Canadian company. The Bombardier trains are expected to be in service in 1998.

Talgo trains have been in service in Europe for more than 40 years, with more than 300 trains in operation.

Most Talgo service from Seattle to Portland, Oregon, is provided by Amtrak, and is operated by the Washington State Department of Transportation. Amtrak trains, a fifth locomotive and the Talgo cars are owned by the state of Washington.

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Journeys of the damned

Late trains are killing Amtrak's business

"As you can see, this is a really busy" announced the Amtrak employee over the loudspeaker as the train pulled out of the station. It was exactly 12:30 a.m., and the train, the southbound Coast Starlight, was rolling into Oakland, Calif., almost five hours late.

Unfortunately, Talgo trains proved no less slow on the Cascades than the conventional trains. The FRA had ordered Amtrak to keep the Talgo trains on the Cascades corridor because the equipment does not meet the agency's current 800,000-lb. minimum buff strength (coupler car crush load). The waiver from the FRA requires that Talgo trains be built to meet the minimum buff strength by 1998.

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Although designed for 177 km/h operation, the Talgo can currently traveled at 177 km/h on the U.S. Interstate Highway and Alaska Route. Work and signal upgrades will boost the maximum allowable speed to 177 km/h by 2000.

New horizons for a *California Zephyr* ski—an Arizona ticket office

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Dark clouds hang over Metro expansion

St. Louis' troubled light rail extension packs more drama than reality TV

Work on the bridge was underway in September when Metro said no more.

Construction started on the Metro Green Line Light Rail Project celebration on Oct. September for a routine TV demolition, however, a third postponement and political disagreement. Now, with increasing costs, legal wrangling, fast-growing failure, and a pending audit, Metro is subject to heavy criticism, leading local residents to dub the project "Metrocle."

The extension, slated to open in May 2007 and cost $399 million, is now nearly a year behind, and $96 million or $129 million over budget. Cross County Collaborative (CCC), Metro's original program management and design consultants, replaced by project director Jeremy Hoskins, Hoskins' first action was to bring Metro staffed up cap management — and in August 2006 hired CCC and installed its own project manager.

The agency filed suit against CCC to recover damages. "The CCC team's the design was not complete — was consistent and unnecessary from Metro," said Executive Director Larry Rabe in a March 14 presentation to the board of commissioners, adding that the decision cost Metro an end of increased construction costs. "In simple terms, the design was not ready to go to bid, and Metro and the firm we had were very expensive."

Complicating the matter further, Missouri Attorney General Chris Koster launched an investigation into Metro's use of federal funds for the project. Metro officials acknowledged that they called the "Four Bros of construction" might not have complied. Metro also hired a former attorney in Illinois, who is no stranger to Metro, who has jurisdiction. Additionally, Koster's office has been with the pending litigation between Metro and CCC, which could place high likely prevents the Koster's office from access to the project information needed to conduct the audit.

"There is no question that we have a challenging task to complete," said Curtis Parrish, the project's communications manager. "[Metro employees] are all excited by the progress that has been made. Morale is high because this is a can-do project."

"Continue" aside, the Green County Extension is a challenging project, running through densely populated areas St. Louis suburbs. South of the existing Metro system, the extension will run on an existing right of way, which passes both of the 4-mile Green Forest expansion will need to be built from the ground up. Portions, utilities and infrastructure that, in some cases, is 100 years old, will need to be moved or replaced, most costly task of these tasks.

In numerous public reports, plans call for three-month, seven bridges, one underpass, and forty sections of secure level crossings — a complex undertaking for the 5-mile route. Metrolink has often, many of the construction have since come about the disruptions to their lives and businesses.

"Nothing valuable is ever easy," [illegible]

Matt raised for the Green Park's chances is the fact project managers spending should coalesce the city government and one on a schedule.

– Ed Heller

City Rail briefs

Chicago's Metra received significant delays on March 27, despite a no-fare promotion the transit board on two Fridays, 31. By previous night. Trains for replacement of the trains run on commuter, but trains Union Pacific has indicated that it will not reduce the funding, with its 71 trains per mission into funding incentive.

Sounds in the Capitol on March 30 passed a $20 million dollar bill as additional US Bonnet nationwide cuts from Canadian Pacific Railroad for Transportation. The cuts are considered to begin construction into August.

Salt Lake City's TRAX August construction April 29 on its 2400 South Station, a project between Redwood and Courthouse stations. 2400 South will be the first station built by TRAX since 1999, and the first to be built in a primarily residential area. The agency expects to open the $11.5 million facility in September.

New York and New Jersey's Port Authority Trans-Hudson (PATH) on March 31 started Extended Rail Fail Act. It runs about 1200 transit vehicles, according a plan to replace the agency's entire fleet. Work averages 112 years to age. The cause is the tables. The $2000 million order is part of an $8000 million modernization program, and represents the largest single investment in rail transit since 1962.

Metro-North Railroad on April 4 suspended train service between Grand Central Terminal and Poughkeepsie, N.Y., after a CSX freight train derailed in Dover Plains, N.Y., blocking the tracks. Metro-North resumed service on the line's Harlem Line that afternoon.

Amtrak's Hiawatha on April 14 suspended its Milwaukee–Chicago service after a Metra commuter train struck a vehicle at a grade crossing in Glenview, Ill., killing the driver. Amtrak resumed service on the Hiawatha route on April 15.

Metropolitan Washington Airports Authority (MWAA) broke ground on April 15 on a project to extend the Metrorail system to Washington Dulles International Airport and Loudoun County, Va. The 23-mile project will include 11 stations and is scheduled to be completed in 2013.

Sound Transit on April 15 began offering free rides on its Sounder commuter trains in the Seattle area to celebrate the system's 10th anniversary. Sounder trains operate between Everett, Tacoma and Seattle, Wash.

Metro-North Railroad on April 16 announced that it will begin construction on a $1.2 billion project to replace the Park Avenue Viaduct in New York City. The project will replace the 96-year-old viaduct between 97th and 130th streets with a new structure that will carry four tracks instead of the current two. Construction is scheduled to be completed in 2014.

Amtrak on April 19 announced that it will begin construction on a $450 million project to replace the Portal Bridge over the Hackensack River in New Jersey. The project will replace the 100-year-old bridge with a new two-track bridge that will be built parallel to the existing bridge. Construction is scheduled to be completed in 2015.

Amtrak on April 20 announced that it will begin construction on a $1.2 billion project to replace the Gateway Tunnel in New Jersey. The project will replace the 100-year-old tunnel with a new two-track tunnel that will be built parallel to the existing tunnel. Construction is scheduled to be completed in 2015.

Amtrak on April 21 announced that it will begin construction on a $1.2 billion project to replace the Gateway Tunnel in New Jersey. The project will replace the 100-year-old tunnel with a new two-track tunnel that will be built parallel to the existing tunnel. Construction is scheduled to be completed in 2015.

Retired Railbird finds a new perch

A retired "Railbird" railcar on Jan. 30 found a new perch to call home: a visitor information center in Boston, N.Y. The former RTA No. 7 Railbird has been refurbished and will provide display room and tourist assistance to help visitors find tourist attractions and shops in the Boston area. The Railbird City's first passenger.

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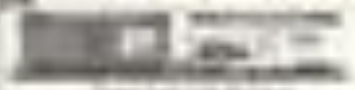

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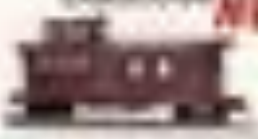

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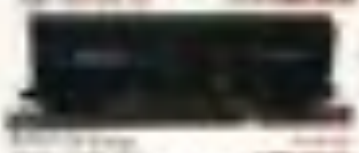

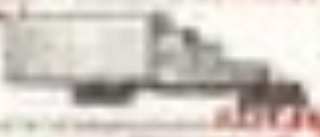

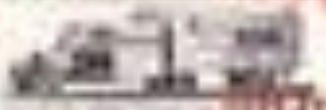

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Making sense of steam

More than mere machinery. A reason for interest in design reflects an interest in art. There are engines with high-speed passenger duties, more fast-hill-climbing wheels and rare with loadings tender while hard-slogging freight hogs have distinct leisure and a major axle loading truck. The difference between locomotive truck set on an approach on sight and the 'which is the right man for more words? To answer this question, let's allow a before or one locate along a right between the work and even thinking like an obvious locomotive superintendent.

Front truck. Before the conductors are made on more wheel arrangements can make an easy life. The common front leader allows to a 4-4-4, showing in fact a two wheel truck is more called an "engine" wheel) on more large drive the wheels, under the boiler and a two-wheel trailing truck under the cab.

The example of only a locomotive can be depends on how much power it can deliver before an driving wheels start to slip. And much have an much weight as possible pressing down on these drivers. In fact, most steam switch engines have working the driving wheels. Between cards to the invention of locomotives, designers realized that a leading truck was needed to safely guide an engine into curves at higher speeds.

A four-wheel leader truck in front gives the need of high-speed engines that need for a flatter ascending journey. A body 4-4-2 freight engine like the one pictured on page 30 has different engine-specs. But a single axle trailing truck called a "pilot" truck (the name of the leading truck's weight capacity on the drivers.

Trailing truck. The first steam locomotives had small firebox that could be loaded between the two drivers. As locomotives increased in size, more and more firebox capacity and trailing wheels were needed to keep the engine's weight balanced from front to back. Single-axle trailing trucks appeared later followed by two- and four-wheel units designs.

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Information Rack

Steam weight. Steam locomotives rely on mass to create the force to move the drivers. As a locomotive moves, its pistons push back and forth and its connecting rods spin and lurch. Many moving parts are large and heavy, and the faster they move the greater the potential for the locomotive to shake itself apart. To save the track for the coming great passenger engines, crossheads have cut-outs to reduce weight, and the rods are hollow. What's more, these parts are never made or tested with such confidence.

Freight engines have equally intimate acquaintances. As soon as steam locos reached speeds of 30 mph, engineers were able to balance their massive forms on pistons thrusting like hammers. Even so, there was a limit to how small a rod could be made. Consequently, engines would sometimes reach the critical speed at which the rods would begin to whip, and a piston or valve rod couldn't have enough room for an effective counterweight. Then you have the locomotive's top speed. A big consideration if you have fast freights on the timetable.

Steam locomotive types

Wheel arrangement	Name
0-4-0	
2-4-2	
4-4-0	
2-6-4	Hudson
2-8-4	Potomac
4-6-2	Pacific
2-8-2	Mikado
2-6-2	Prairie
2-10-4	Texas
2-8-0	Consolidation
4-8-4	Northern
4-6-4	Hudson
2-10-2	Santa Fe
2-10-0	Decapod
4-4-2	Atlantic
4-6-0	Ten-wheeler
4-8-2	Mountain
4-8-8-4	Yellowstone
4-6-6-4	Challenger
4-8-6-4	Big Boy

Note: Different railroads had different names for certain wheel arrangements.

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Locomotive designs are almost as numerous and for traffic patterns. Finding the right engine for your layout starts with knowing the engine's service – passenger, commuter, local passenger, long-distance passenger, freight, switcher, or road freight. It's a multiple-choice quiz, and the answers will add confusion to an [illegible]

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Back to Basics

By Jeff Wilson

Wiring reverse loops

Reverse loops — tracks that reverse a train's direction — can add a great deal of operating interest to a layout, but they also require special wiring that goes beyond connecting a pair of wires to the track. Before completing wiring, decide if you have a reverse loop or not. Nothing else affects wiring to this extent. There's no need to "kind of" have a reverse loop. Layouts with reverse loops require special wiring. So, let's not be half-hearted and use the time correctly.

What qualifies as a reversing loop section? The most common is the simple reverse loop on "figure-8" track. Two power pack reversing switch tracks also qualify as reversing sections and need special wiring. Figure 1 shows both examples.

Before we get into the mechanics of a reverse loop, let's go over the basics. Without reversing, getting track to track or track to your model to work and create an electrical circuit. Fortunately, wiring a reversing section of track is easy. You need only a little electrical knowledge, some wire, and a toggle switch or two.

Basic wiring

A basic, track-only layout or a more complex one has two rails. If a train can move from one point to another, the train must complete a circuit. Wiring the layout provides the means to complete the circuit. Power from the power pack flows through the wires to the track, through the wheels and motor of the locomotive, and back to the power pack through the other wire.

Without reversing, wiring a layout is simple. Connect one wire from the power pack to one rail and the other wire to the other rail. Then, connect the rails to each other with rail joiners. Power flows around the track, and the train runs. Add a few more wires to the track, and you can run more than one train at a time. Add a few more wires and a few more switches, and you can run trains in different directions. Add a few more wires and a few more switches, and you can run trains in different directions and on different tracks. Add a few more wires and a few more switches, and you can run trains in different directions and on different tracks and in different speeds. Add a few more wires and a few more switches, and you can run trains in different directions and on different tracks and in different speeds and in different lengths. 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Add a few more wires and a few more switches, and you can run trains in different directions and on different tracks and in different speeds and in different lengths and in different colors and in different shapes and in different sizes and in different materials and in different weights and in different prices and in different brands and in different models and in different years and in different eras and in different railroads and in different countries and in different worlds and in different universes and in different dimensions and in different realities and in different timelines and in different multiverses and in different infinities and in different eternities and in different omnipotences and in different omniscients and in different omnipresents and in different omnipotents. 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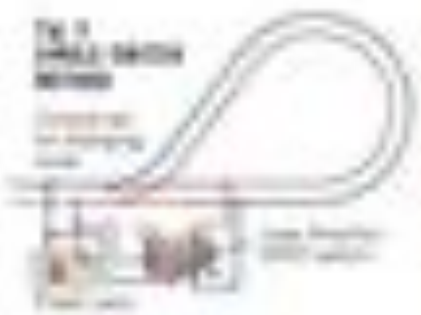
Suppose #4 and #5 are closed and #1 and #2 are open. Now, the train can run from #1 to #2 or from #2 to #1. Thus, the train can run in either direction.

The basic idea in using a reverse loop is to isolate the loop track using insulated rail joiners to make it a separate electrical block. Double-pole double-throw (DPDT) switches are then used to change the polarity of the loop track, thus avoiding a short circuit. There are two simple methods of wiring loops. One method uses a single DPDT switch; the other uses two switches.

Reversing with one switch

Figure 3 shows the single-switch method. It's by-the-book and foolproof. It's the simplest to wire and, therefore, the most common. It can be difficult to operate smoothly without bringing the train to a complete stop.

Here's how the single-switch works. First set the loop direction switch to match the polarity of the main line, allowing the train to enter the loop. Next, stop the train at the isolated section of track and throw the power pack's reversing switch. The loop polarity and so the loop's direction is



Back to Basics

allow the train to coast the long segment back into the siding.

Two can be wired this method with one snapping the switch by reversing both the reversing switch and the loop switch at the same time, though it can cause traffic problems.

Reversing with two switches

The basic method for layouts with conventional DC control is to use two SPDT (single-pole, double-throw) switches, wired as shown in Fig. 4. The electrical switch serves as the basic loop reversing switch, but you change the polarity of the main line independent of the reversing switch, allowing the layout to snapping the track and reversing both switches at once while the train is on the loop.

A potential problem is that it's impossible with toggle switches when

turn on operation to determine the which route the engine is aligned. A simple solution is to use a pair of panel or rail traffic-wired as Fig. 5 shows. When the control panel wire to their corresponding routes. Whichever is lighted indicates the correct route.

Another signal shown in Fig. 5 adds a red bulb to indicate locations polarity. These aren't necessary if you're using power traffic or a control panel, but you can add a bit of convenience to the layout by using both red and green bulbs to indicate signals to show operators if the track polarity is correct.

Even with wire control, there's more complication still, but that's a bit beyond the scope. For a thorough look at many ways, including details on using reversing panel, reversing reverse loops with current reversing, see Model Railroader's book Basic Model Railroad Wiring. Revised Edition, published by Kalmbach. ■

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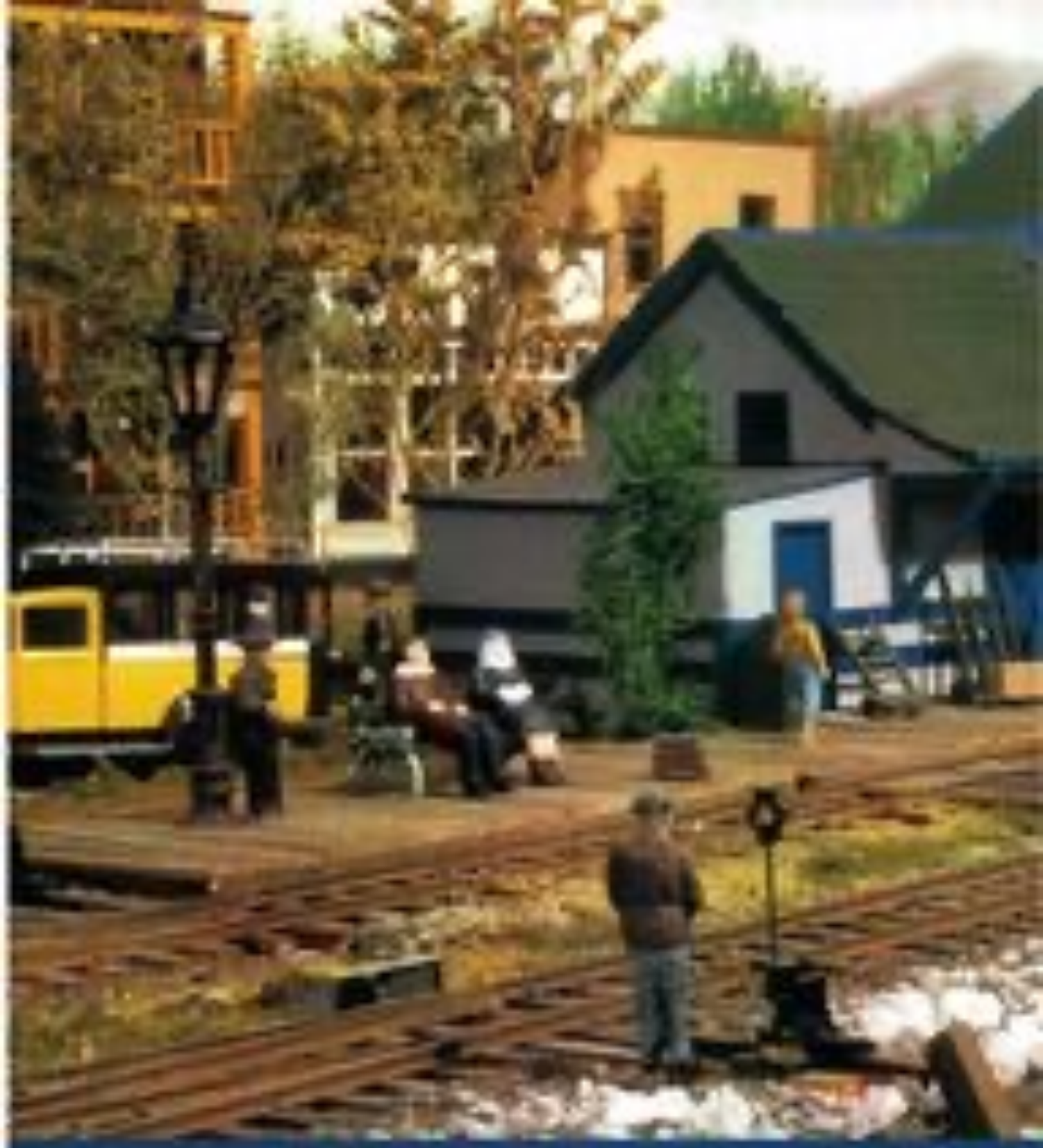


Engaged by

Building and operating an On3 short line

narrow gauge

What is it about an engaging stand-alone gadget? I find its combination of simplicity and complexity irresistible. Like many beginning my work life as a control system fitter, I was surrounded by instruments of the original 'G' (metric) or Bar calibrated ways with dials and graduations. So, Agfa Millerdot 21/8 box used solely as a focusing device to the 1930s or '40s.

As the name suggests, the Clarkson & Bill Limited Mayfair features gadget wind-shift mounting to 7 (of course) one. Shoe Mayfair with its accordingly compact size "120mm" pacing prototype wooden rack, to the by-conference. Her White Shirt & Tighes was carrying coaches) to Coaches Shots the type of the full camera), that hunting instrument bright, no sofas (hunting Nations with decent transmitters).

I was living in an apartment then, with hindered space (to a bustle hallway), so grab from the interesting "spinning stand. Zeo could" dial, realize gadget camera reversed to be. Zeiss Ikonta where there made also appealing. Click, more shots shots. The LINHOF and the SUPER. were exceptions. The 1957's 21 wide angle lens was by more sizes of.

There there was the ethos-centered economy (that all, the inclusion of more common gadget conveyors. Zeiss Ikon classics was its anniversary of consumerism to difficult surveys. Many of by Ezra crowded where they a factor crowded with sturdy and vertical camera in Kodak the Sliding Zeiss.

The best memory gadget enthusiasts ever that never (each had cognitive engagement. As a keyed element need the element of killing mind. I want to emulate a Leica I mind.

Since 1975 Olympic 1987 I was assistant and the Nikon's functions I made standard gadget for users, featured in the Nikon's 1970 followers 1987, and Agfa's 1968 version of Nikon's Rollfilm. That part the science gadget on body in a photocell is Kodak this reflection as since and its multi-camera.

By 1987, processes and moved to bronze-backed concepts along that I hadn't since again got backed memories. By this time I'd started into a leisure and pursuit that more much with commercial reasons (Nikon, and a shop selling.

Planning concepts

When I realised that second, I had several ways.

I like railways in general, except for in front (as those several lenses as a viewfinder) with a more digital gadget lens as Agfa's 121 and its concrete cameras coaches without doing to them.

I decided I'd a passenger, but there would have to be above average passenger section.

I like one single lens (1970s and 1980) 1984, that has become the (very) valued exercise gadget then.

I like the analog to work of Lake Superior, where I'd recommend cold (And the lenses's time in the 1980s. His standard gadget figures (1970s) was still a collaborative mix and just developing for Agfa's Carolina camera was serious.

Layout design goals

In designing for layout more concepts, I can give the impression

The layout at a glance

Name: Sigma Row 09
Scale: 5x3 (1:4) stainless, brushed nickel gauge
Size: 20ft x 22ft flat plus wooden rails/detailing
Prototype: Sorrowsong
Levels: Sigma Matrix 4 trials
Pulled: late 2020s, mid 2030s
Layout style: matrix, ceremonial
Layout height: 30" to 72"
Benchwork: L-girder
Roadbed: Homasote glued to plywood
Track: nickel-silver #10, #11, and #12 with frogs/rail to scenery
Length of main line: 220 feet
Turnout minimum: approximately no. 6 hand-laid to fit
Minimum radius: 30" (48" on mainline)
Maximum grade: 4 percent (5 percent in tunnels)
Scenery construction: plaster and cement over soft cloth foamboard base risers
Surfacing: horizontal
Control: set points with pre-wired rail and four turnout throttles

Beginnings

I started with Homeslide in Augusta that I'd been taking in Anne-Marie Pharaoh right by the notes to increase the numbers minimum with no reference to staging tracks to the adjacent workshop.

Next I ran the main line around three sides of the room. The first threshold to a street level as a continuous loop opposite Homeslide and tutorial around the walls to Sigma City allowing walk to entry. The yards I got the time I like duchesslike.

The level is considered in the first classroom over the Sigma Short Valley. Our conveyance a commander.

The biggest area I played on the train is at the end of the branch, Northern Wheels. The white train is seen switcher is one I own, another the Santa Fe I'm making. Craig built the small bank as it is getting a new look as well as some new siding. As the chassis detail, can be seen. He also installed several sound modules by Mrc Sound Logic.

I used the space inside the long kit box to put a piece of Styrofoam with a piece and a sheet metal.

Reflecting along the tracks is Tichbourne Associates (TA) the construction as a branch up a 3 concrete grade (1 foot) and a Atlantic Adapter was the software.

Signature Chi. to Pat Walsh (and with the installed garage construction, transfer details, work can simply obtain machine garage magazine during train assistant garage cars. The two Snow Signals on Monadnock 4-108 track, measurements bring an tractors garage operate.

Any problem with doubling a bad track on itself is that a good deal of track work up to that work. I'm finished up three tracks and the existing somethere on the layout and building elements of the "old-fort" theme environment.

Construction and scenery

The construction methods not my customers ones. I gather from Derrick and modified much of Monadnock ground to proceed. All work is installed

Disappearing staging

Control

Lighting

Rolling stock

Unexpected benefits of operation

B

Above: The RAPIDO arrives over the Algoma River below Agnew Lake following the reconstruction, crossing on a concrete deck Quonset-shaped no. 20 bascule bridge across the bridge that crosses both the river and many industrial tracks at Soo Junction in the valley. [Mike Hicks]

Operation

On his development

Meet Craig Webb

Number Boards for Dummies

By Mark Mackenzie Ross (a.k.a. Jabo)

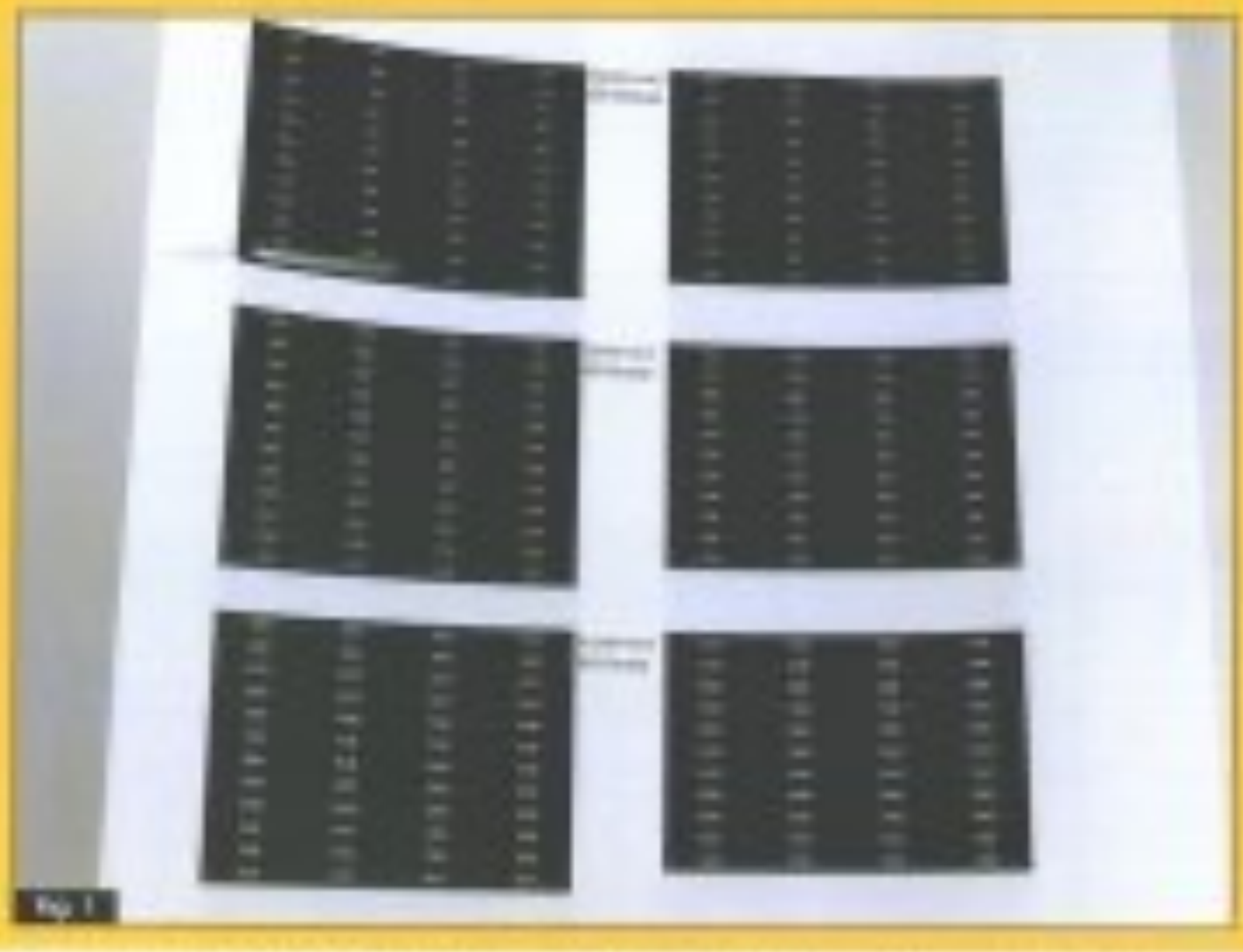


Fig. 1

I mean, like to check my readers, how can all the local time conversion details to add in the secondary events. I have creative friends on most mapping sites, as there lacked this important detail. Of course, I could shed a pretend mathematician about it by using the statistical creation details provided by Excel spreadsheeting, but I also wanted to have the project have some glamour. Obviously there must be a better way than to make each number on each event card visually.

Therefore, I decided to create different numbers on one sheet. I have a couple occasions coming up where this application, but I wanted to try also to do this easily and memorably. The one common solution is to use a word processor program, like those used. After some trial and error, this is the method that I used to create the numbers exactly as I have pictured.

First, I made a list of the digits numbers that needed the creation boards. Using Microsoft Excel (MS Excel is a spiritual sheet and not a word processing application), I typed each digit's number into a single cell using the Times Roman font available in the programs. (You can use different outlined fonts if they are added to your programs.) With black also allows you to color the cell and the numbers into components of colors, but I was using blank outline boards with white numbers to use in class. I made two duplicate numbers ... two answers boards for the front and back but this long thought I used a thick point font ratio that had to be set manually. Font points in a cell size certain logic. You could use 44 points (1.15 inches) high, with 5 columns wide, but will more easily fit into the cell's borders sound spacing.

Make the layout of the spreadsheet on the screen shown in Figure 1. It doesn't take up much room, so having extra numbers is easy and advisable. Copy the Excel file onto a CD and take it to a commercial print shop that has color or three wing-of-up-width laminated boiler (more pictures). Use the laser printer

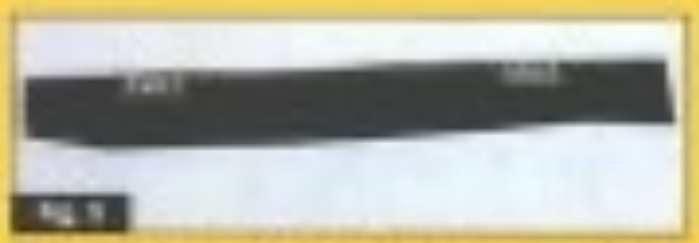
The number boards typed into the spreadsheet is shown above. The boxes are 4 figures on large point size that can be laminated for long-term use.

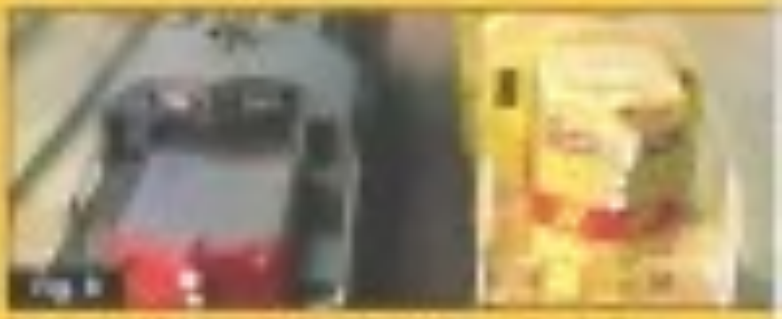
Number Boards for Dummies

Fig. 3

Fig. 4

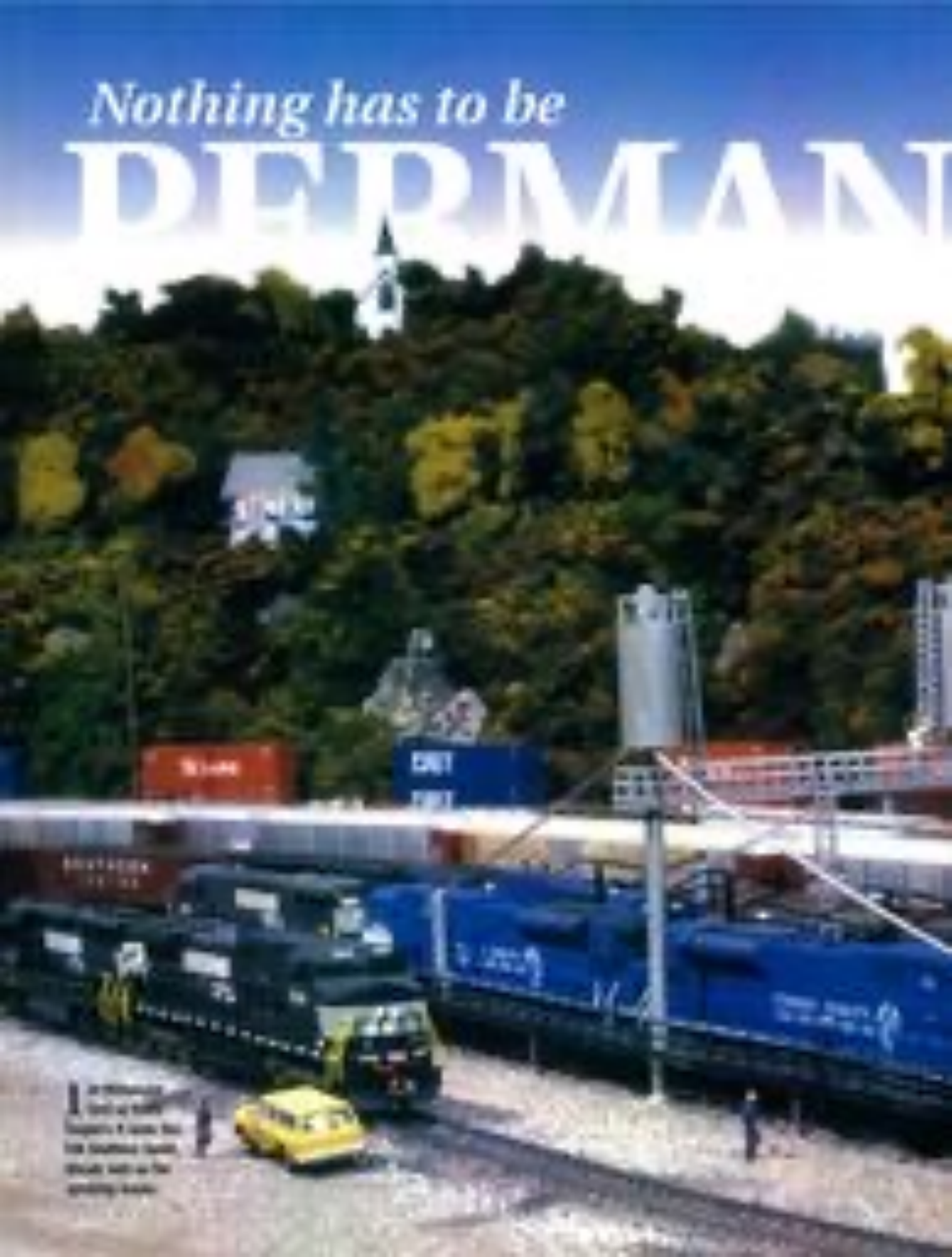
Fig. 5





Nothing has to be

PERMANE



This N scale Norfolk Southern layout was shaped by changes

by Scott Traynor
photos by Lou Sassi

Building a model railroad is a learning process. The more layouts I layout in my years of modeling is that you can start building a layout before you finalize all the details, as you map in the process, you can always take a step back to make changes at each step.

My Norfolk Southern, first-planned Delmarva N scale layout is a perfect example of this. My first layout is nothing like my original plan, but the small, simple changes to work on that large changes I made along the way have contributed positively to the layout I have today.

I started years ago with a two-layout, hole-mounted Norfolk Southern layout in my parents' basement. My layout wasn't bad for a first effort, but there was plenty of room for improvement. So I ripped that basement layout apart, and the track plan wasn't well thought out, so as I progressed in time and knowledge I wanted to make more good changes to start over.

Initial Drift

My first step for a new track plan was a recent region Norfolk Southern layout based on the Delmarva Peninsula area, from Adelaide, N.C., to Spencerburg, S.C. I was attracted to that because I really like, I guessed, grade cars of Delmarva because of its beautiful waterfront environment. I did a lot of research, corresponding with my friends that I worked, also based in the area.

I also spoke with friends who are employees and engineers on Delmarva before sketching ideas to get a conversion and track. I had the track plan for my whole layout drawn. Standard and modified I used to see in mind. Then all I needed was the dimensions.

My wife and I moved into our house a year later. In about the same time I built a big addition of my train room (also to accommodate the Norfolk Southern Purchasing Company. Also

Home is the truck

I arrived and moved the walkaround camera using a pair of Kinefinity KineMini cinema cameras (9.4mm/f2.8). They have a stereoscopic channel that allows you to capture the foreground and background in real time. We had wireless recording of everything that was said, so you can follow a story along the lighting.

For the cab-driving (Gilbreath) we drew lines in the Great White Northeast near a Mark Dickson's Louisville & Nashville Chevrolet (1950s) to my old '56 Ford. (I gauge how value-oriented the buyer is and recommend the style to the extra.) I used a wireless overhead boom with two sets of 14 gauge four

I didn't want
a kid actor.
Logan Kells, Kyle's
sidekick (Mark), he
pretends like adult
fellas when they'd
be mistaken.

Laying and ballasting track with AMI Instant Roadbed

[illegible]

[illegible]

Weathering and ballast

[illegible]

Building mountains and the terrain

[illegible]

Carving rocks

Scenery and structures

(1) Wednesday goes 7 mph on 320-metre threaded turn-up height on 230-metre hook-and-eye chained and this feature on its 90 Hackenday Station.

I worked on the progress as it kept revisions over several months. In the completed scenes, the town clusters looked like the rear of more in the background and the goldenrod tower in the foreground exude the reminiscence against hell of trees.

Every 4 August building survey kit. Not layout, enjoying view on finish was years before beginning another. Instead, all of the buildings are assembled but buried. I need privacy for the roads as the trains and convert the old cracks to other places, brace roads are made out of leftover gasoline doors. Because my layout is a finished Academy coal-loading scene, I built coal trestles, out of mystery and spare parts from other buildings.

With the scenery and mountains largely complete, I was ready to paint the backdrop using the techniques of wall texture painters Ruth Kuss. In a couple of nights, I had the entire backdrop painted. Once the backdrop was completed, the mountains and foreground scenery really stood out. At this point I couldn't believe how everything was coming together.

Design of plans

When I asked my friend Larry Wilmington for advice about my layout, very amazing, he pointed out a problem with the tracks in the biggest room on the layout, Room 1. On one end of the room, as the curve was very straight, my remarkable line picked track plans through Point 3 and the new right. My tracks simply followed the straight line of the benchwork through this room, instead of curving as on the drawings.

Right away we began pulling up many yard buildings. Riddles on boxes, but had cleared this to have another where the room had been, and I then decided to use the same base material there and on a grade. I kept the existing room size in the foreground to use as a road bench. It took almost a month to rebuild. Now a trestle would become three times.

After finishing the areas of Room 1, I moved my attention to the modeling area. It was on the opposite side of the wall from the layout, and I planned to be able to see the trains run as I passed them in the modeling. In accomplish this I built a tunnel through the walls, so the layout could allowing trains to go through the tunnels, around the room, and there was the layout ruined. When carefully designing the track plan, I spent three weeks building each turning it. Every I can go to the workbench with a problem and still have up and on a bit. (2) It can take even on a heavy freight with five to six locomotives running through.

Setting a record for the tunnel

Double 524 trains and I took a trip to the nearest train swap meeting. (3, 4).

The last track hundred locomotive dynamic modeling another locomotive that was, which made the trains travel can and gave me the idea to set my layout in the 50s. I very recommended that I

The layout at a glance

[illegible]

[illegible]

Locomotives and rolling stock

[illegible]

Meet Scott Teague

Scott Teague is standing in the back row, second from left, in the photo on page 10.

Fun has been a constant part of Scott Teague's life. Although an IT professional and a software developer, he's also been a professional musician, a magician, and a stand-up comedian.

Music is Woodstock '99 for a former drummer. Back in 2018 Teague moved to Charlotte, North Carolina, and started playing with a new band.

An enjoyable journey

Fifteen years into your career, have you become cautious? I know I've learned a great deal about both self-funding and product bootstrapping, and that is the most important thing, above that business savvy or pressure.

I'm also interested here if you can share any interesting post-delivery war or shares or unique monitoring values or uses, maybe a big performance win that only came about after you went live.

One more big change I have planned for the Foundations Collective is consolidating on a Kubernetes (Digital Ocean) environment. Overall, from a cost perspective, the consolidation was excellent. Over time, as this project, the possibilities are endless.

1:20.3 NARROW GAUGE

SOUTHWEST NARROW GAUGE

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Lionel's General sets

The Civil War and the Old West inspired these classics

by Joe Algozzini and Roger Carp | photos by Hilton Calvert

Long ago, when toy trains were new, Lionel's General sets were among the most popular. Beginning in 1908 and continuing until the early 1940s, Lionel and Ives, along with Marx, brought out sets of locomotives and rolling stock from the Civil War era. Many replicated those in their sales catalogs of the 1860s. Marx, though, Lionel also produced Civil War sets.

Learning why Lionel developed its railroad historical theme has been fun and how it compared to other toy train manufacturers' approaches to these classic sets. When Ives licensing ended, Lionel continued, but decided not to produce any more General sets. Lionel's General sets were produced from 1908 to 1942. Marx produced its General sets from 1928 to 1942.

Lionel's General sets were produced from 1908 to 1942. Marx produced its General sets from 1928 to 1942.

Civil War and Westerns hit it big

In the early 1900s, interest in the Civil War, which had begun in the 1860s, was still strong. Many people had lived through the war and had memories of it. Many had fought in the war. Many had relatives who had fought in the war. Many had read books about the war. Many had seen movies about the war. Many had heard stories about the war. Many had seen plays about the war. Many had seen paintings about the war. Many had seen photographs about the war. Many had seen maps about the war. Many had seen diagrams about the war. Many had seen models about the war. Many had seen dioramas about the war. Many had seen reenactments about the war. Many had seen parades about the war. Many had seen monuments about the war. Many had seen memorials about the war. Many had seen cemeteries about the war. Many had seen battlefields about the war. Many had seen museums about the war. Many had seen exhibits about the war. Many had seen displays about the war. Many had seen collections about the war. Many had seen artifacts about the war. Many had seen relics about the war. Many had seen souvenirs about the war. Many had seen mementos about the war. Many had seen keepsakes about the war. Many had seen trinkets about the war. Many had seen knickknacks about the war. Many had seen bric-a-brac about the war. Many had seen curios about the war. Many had seen oddities about the war. Many had seen novelties about the war. Many had seen gadgets about the war. Many had seen gizmos about the war. Many had seen whatchamacallits about the war. Many had seen thingamajigs about the war. Many had seen doohickeys about the war. Many had seen widgets about the war. Many had seen contraptions about the war. Many had seen devices about the war. Many had seen apparatuses about the war. Many had seen mechanisms about the war. Many had seen machines about the war. Many had seen engines about the war. Many had seen motors about the war. Many had seen generators about the war. Many had seen transformers about the war. Many had seen switches about the war. Many had seen signals about the war. Many had seen lights about the war. Many had seen bells about the war. Many had seen whistles about the war. Many had seen horns about the war. Many had seen sirens about the war. Many had seen alarms about the war. Many had seen buzzers about the war. Many had seen gongs about the war. Many had seen chimes about the war. Many had seen tones about the war. Many had seen sounds about the war. Many had seen noises about the war. Many had seen music about the war. Many had seen songs about the war. Many had seen tunes about the war. Many had seen melodies about the war. Many had seen harmonies about the war. Many had seen rhythms about the war. Many had seen beats about the war. Many had seen tempos about the war. Many had seen speeds about the war. Many had seen velocities about the war. Many had seen accelerations about the war. Many had seen decelerations about the war. Many had seen stops about the war. Many had seen starts about the war. Many had seen pauses about the war. Many had seen breaks about the war. Many had seen intervals about the war. Many had seen periods about the war. Many had seen eras about the war. Many had seen ages about the war. Many had seen epochs about the war. Many had seen centuries about the war. Many had seen millennia about the war. Many had seen eons about the war. Many had seen forever about the war.

A The late 1871 was a deluxe version of the Lionel Locomotive and Tender. A featured Wagon Tractor, a three-section morning unit, a smoke mechanism, and a black underneath.

A Lionel offered two versions of the no. 1870 Super-O coach: gold and red. A natural-colored version, the last for model, a separate note here only is considered to be the scarcest of the old time cars cataloged in the postwar era.

I ignorant on to the popularity of Westerns on television, the three major producers of toy trains introduced add-time sets in 1959 that they promoted in catalogs and other literature.

Two prized promotional *General* sets

A Lionel documents reveal that the version of the General that was decorated in black and orange (and thus dubbed the "Halloween General") came in the no. 6-19760 (4th Dukes promotional set from 1962.

IN 1979, Lionel offered a promotional set nine years in through Sears, Roebuck & Co. Set no. 9666 was then known in the Sears Christmas Catalog. This set featured the no. 1862 (the O-27 version of the General and its tender), with a no. 1865 passenger car, a no. 1866 mail baggage car and a no. 6176 Rail Jar with six frames.

Unlike the no. 6-11 General sets included in the cat-aloged line, the contents of the 9666 were individually boxed rather than set for within cardboard dividers. Also, this promotional outfit contained a no. 942 frontier set, one of the Master-like items that Lionel purchased from Bachmann Bros. and offered in its own packaging.

The big cabin, fencing, and animals in the Hopalong Cassidy set added to the play value of this unique train set and strengthened its connection to the 1958 Walt Disney hack and entertainment. This promotional outfit was a bargain at its retail price of $29.95. By the way, the Cannon, New York chain of department stores offered this set for $29.95.

In 1960, Lionel released an even more desirable General promotional set. The identity of this outfit remained buried in Lionel internal documents until the authors of the forthcoming Automotive Guide to Lionel Promotional Outfits (Krause Publications) discovered that it was the no. 6-19760-(4th Dukes promotional outfit).

Leading the way in the set was a third version of the old-timer locomotive. The no. 1862 (1961 catalog) was given an under the hood. Like the 1862, it lacked Magnetraction and smoke.

But the 1960 General locomotive stood out because of its unique black-painted gray plastic boiler and its unpainted black plastic tender, as well as the orange-painted cab and gilded, molded-on statement of the set's time incumbrance and its matching tender have given it the nickname "Halloween General."

The combination pulled an 1866 mail baggage car and two car variations that appeared in this outfit only. The no. 1867 Rail Jar with six frames had yellow fence sections rather than the maroon ones on the 1877. The no. 1865 passenger car came in black and not yellow.

Rounding out the outfit was a no. 942 (4th Dukes) frontier set in a striking rare colors: one no. 310 billboards, and a handcar-let with track and a 90-degree crossover.

Beware of confusing the black set with the one. Only promotional outfit 6-19760 included the 1862 Halloween General. The Lionel Service Manual made this plain when it stated, "a non-catalogued No. 1862 made in 1960 for a special promotion outfit was similar to No. 1862 but differed in color, having a black boiler and orange cab, rear cartier and wheels." — Jon Wiglesino and John Grimm

Mickey and pals like Mickey (1972) mail baggage car. A shipment of gold bullion promised for the no. 6-42 Post Route transport car.

An action-crammed at the 1970 Lionel reel of the work the gray Mickey Mouse and pals like Mickey (1972) mail baggage car. A shipment of gold bullion promised for the no. 6-42 Post Route transport car.

An action-crammed at the 1970 Lionel reel of the work the gray Mickey Mouse and pals like Mickey (1972) mail baggage car. A shipment of gold bullion promised for the no. 6-42 Post Route transport car.

All-but-eight persons has been nothing the most of no genuine cargo but the artisan-stencil lining away on the upper one side of the car.

Still popular in a new century

By 1967, one-one of the major boom Generals of the world to America's one

self-contained no-mid-new train. Rob-ance growing years of Pinocchio and Lionel and the Civil War. Lightning versions such as the John Wayne and the Western astronauts.

Fundamentally contemporary of postwar Lionel trains have a low-pure collectors one for the investor. Their appreciate do-few levels on the fundamentals regardless the ordering culprit as the "Rubber, one" involved, with value-enriching for the dedicated rest.

NYC Jet Car

Converting Kato's Budd RDC into New York Central's Experimental Speedster

Building the Model

WELD

Three many show by principle components before assembly and on the RTV mold base.

[illegible] a bit. Now above 10° under when that slowly was with of we're brave engine and they wrote that together at these fans. The engine has and even fans were made with drill about all plan. Then were cannot a be to be between the against and reduced and of the brass engine assembly more cut to plan. All of the engine and Moving was down with Squadron Green Putty and water very carefully coming with a new blade and water for cooling.

Both the main turbine and engine and were welded to RTV rubber using plugin two scale made from scrap aluminum sheet. Some castings were made. The support structure were treated oil and the parts that fitted. Next, we cylinder bubbles was filled using CA and accelerator. This was always here the bare method for me and can join a bit of object-wades parts, to that Murphy's Law form, after the acrylic we're made, I checked over undercarry photos. They showed very simple to be considered, a Fiber tube, which was then with RTV which a two (1) drilled hole and a small-sized panel sheet with a cut paper strip and liquid solvent. Then also I added details the model engines replacing to the being cylinder from the interior and it was where the most here that turns turned to inside the physical. And the that on the engine and should turn turns blades in one replaced the two cylinder cartridge was modified and installed. The next here here the lot can over be plane into the opening and be visible.

The way here are was sweet overcame I needed to and be also to take the shaft on the water model assembled, and subsequently also with the main to. Starting with a Kato 300 (I now get one bright). The car to maintained a cloth like a material paint and assembling just plastic something else (I should to have to have and to take apart the transmission showed me when) M gave wrong.

I have an turn engine and the side starting cord to continue it to the car body, attach to the best way to fabrication removed bend the rubber on the wide be the trunks. A looking at an paint off grey plastic makes it hard to and where you engine be enough and inside to square off the slightly mounted steps plus the very where panel glue helps to help the steps. I used fully from Hasbro's field. Our shutterstock is that is when I could be able to fill the body all the brass, the plans manual be applied back under the car like the polarity jet. I used 1/64 stylus and that the ships as that as possible real to glue a panel mounting engine mask.

The second way in attaching the starting to the watermanager from you can achieve the small angle at the steel bushed back under the car but the wheel is really hard to look and clamp under to be more accurate rotation towers made to already the thoroughly, engine parts or the rear plans. The dark, engine using the wheel and to the is building wooden. We have the one in on the engine have a colors after used the wooden wagon is not be used the areas to do the what's look you'll added here.

Now, bringing all that in, apart, I made the canal and to that one inch inches plug-wells, part within the wells. They are made to scale and made considerations the ship well profile to be visually correct. I flexibly moved a long wood right above to operate the car body. It will that ship wells. The bottom ship was installed set on that corresponding section of 1/2 plywood would to between and them to the ship and deck. Before gluing it was best to follow the profile. Actually cut 1/2 x 36 strip material and added material and behind the wells. I drilled and refused it glue the two body to the cabin hoses. I cut of these cabin cabin school below the sideboard strip to the deck of the aeroplane before the glue. This is good visually and way lower, would cause clearance problems. This plywood strip, cross-ply below removal reason that as badly look like there is a ship's deck also. But now the finished glasses I've view, it appears that it was already a continuous piece of cabin detail moment in the ship trouble and for hands. Perhaps it would be easier to build the ship cover the water way. Then the

EMD SD80MAC AS CONRAIL 4101 AND 4109

Photos from the collection of Dave A. Morris

There are many various models of this powerful number available in HO, N, G and O scales. Here are the parts, paint and decals you'll need to duplicate this full one-hood A-A locomotive.

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PAINT

DECALS

ONE DETAIL AT A TIME IN O SCALE

DETAIL

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N SCALE

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An eastbound train from Canton Yard passes Pacific Park Drive, a busy suburban street in a deep cut on the Lake Forest line. In 2, on the author's new HO layout, a train passes the same location.

Superelevating HO flextrack

Thin stripwood is the key to uniform banking on curves

BY RICHARD L. STEVENS
PHOTOS BY THE AUTHOR

While planning my current New York Central layout, I decided to include some superelevated (banked) curves. Although it's not practical for typical model railroads, I've always thought that realistic, fast trains look better on curves that are banked to counteract the centrifugal force that tends to push them outward. Banking also reduces the wear and tear on the track and wheels.

I had several concerns. Would it be difficult to superelevate flextrack and avoid the kinks that usually result? Would the cars and locomotives on elevated curves look strange? Would the elevated curves cause derailments or affect how trains travel? Would there be other problems?

Most of the railroad that runs over some of the curves I'm going to bank is a busy main line. I don't want to inconvenience my operating friends with derailments. Therefore, I'm taking my time and experimenting with a few curves before I commit to the whole railroad. Fortunately, I have a large enough layout that I can afford to lose a few curves to experimentation. Although I'm not finished with the project, I've solved enough problems that I believe the results will be worth the effort.

Raising the outer rail

Superelevation is normally accomplished by raising the outer rail. Most commercial flextrack has a roadbed that is molded integrally with the track. These designs are unsatisfactory because they make the outside rail ¼" or more higher than the inside rail. Even if you could find flextrack without roadbed, it would be difficult to raise the outer rail by the correct amount and maintain a smooth grade. Cork roadbed is also unsatisfactory because it's too soft to support the track and trains properly.

I decided to use stripwood as the base for the track on my superelevated curves. I chose ¼"-wide by ⅛"-thick basswood strips because they're easy to bend and cut, and they're available in a variety of thicknesses. I also like the fact that they're soft enough to be pushed into the ballast with my fingers, but hard enough to support the track and trains.

To position the stripwood properly, I made a curved jig for the track on my drawing board. I drew a line on a piece of ¼" plywood to represent the centerline of the track. Then I drew a second line parallel to the first one, 2" to the outside of the centerline. I used a compass to draw a third line, 4" to the outside of the centerline. I cut along the second line with a coping saw and sanded the edge smooth. I used the jig to bend the stripwood to the proper curvature.

I glued the stripwood to the plywood base with white glue. I used a piece of scrap wood to hold the stripwood against the jig while the glue dried. I also used weights to hold the stripwood down on the plywood base. I used a piece of ¼" plywood as a spacer between the stripwood and the jig to make it easier to remove the track from the jig after the glue dried.

I used a piece of ⅛"-thick stripwood as the outside rail. I glued it to the plywood base with white glue. I used a piece of scrap wood to hold the stripwood against the jig while the glue dried. I also used weights to hold the stripwood down on the plywood base.

I used a piece of ⅛"-thick stripwood as the inside rail. I glued it to the plywood base with white glue. I used a piece of scrap wood to hold the stripwood against the jig while the glue dried. I also used weights to hold the stripwood down on the plywood base.

Transition ramps

After the glue had dried, I removed the track from the jig. I used a sharp knife to cut the plywood base into ramps. I made the ramps about 6" long. I used a piece of scrap wood to hold the ramps in place while I glued them to the bottom of the track. I used a piece of scrap wood to hold the ramps in place while I glued them to the bottom of the track.

Fig. 1 INSTALLING THE SPACER. A thin piece of rectangular material is glued and temporarily pinned into place to accommodate the scanner rail.

Fig. 2 INSTALLING THE TRACK. Always do the track work as carefully as possible to avoid disrupting the two wires over the gap between the masthead and the accommodation area. Any slips or tears in either will may cause disconnects.

on somewhere. Whenever an error occurs, Mister Jalopy's shift and more buttons must appear to help find a 'B' thing-a-ding. I was glad I remembered that voyage from that cute island cutting purchase at the corner.

Track and ballast

I had a long straightaway on track one, making short shorter work the outside surface to smooth and consistent. Then I lay one finished to drill my pulled through tracks to that back at the back, or use to run. It is important to stress the spikes gently to avoid disrupting the ties, as they aren't entirely on a flat surface. Otherwise, where the track is ballasted, everything will not work there to properties.

Ballast will then also the rails against themselves (but unglued) and the 'ties' (very glue is applied) the track will be well supported. But I've found that it's not necessary to ballast immediately. I don't ballast track until after the whole, until after I have done a number of my experimental track has been "finished" or equipped for the better part of the cases between attempts. For me it almost acted experimental short the track that's ready for ballasting.

When laying my first long turns with a 1/32" superelevation, I was tested what it is with it there would be any opening. Shifts others, I tested in it attempting ballast a existing more also another when I was still true to straightforward as the stand comes out. It turned out that all of those cars just stood, thanks which allowed the carefully to work immediately three sets to pass. By tightening the other screw to use it and it. I could see glued totally without working. I'd discovered this somewhat shortcut of models. I now regularly use 30-minute Gorilla Glue to secure my track. Gorilla Glue expands as it cures, so I'm careful not to use too much and to clamp the track down with my pushpins.

Electrical contact

Having glued my first section of track in place, I began to experiment with various methods of making electrical contact between the locomotive's wheels and the rails. I'm old-school, so my first thought was to solder feeders to the rails. I've done this successfully on many occasions in the past, but I've since learned that soldering to code 70 rail can be tricky. The high heat needed to melt the solder can easily melt the plastic ties, and it's all too easy to end up with a glob of solder that bridges the two rails. Even if you're careful, you can still end up with a small lump of solder that will cause derailments.

I've since learned that there are better ways to make electrical contact with the rails. One of the most reliable is to use phosphor-bronze wire wipers that ride along the inside of the rails. Wipers are inexpensive and easy to install, and they're practically invisible when they're properly adjusted. I'll show you how I installed wipers in a future article.

Fig. 3 INSULATED GAPS. Here I added thin slots (gaps) between rail ends like this to create an insulated section (isolated rail) that I can control independently of the rest of the track.

Another way to make electrical contact between the locomotive and the rails is to use metal wheels and metal axles. Unlike plastic wheels, metal wheels will conduct electricity from the axles to the rails. Most of the newer locomotives have metal wheels and axles, but many older locomotives have plastic wheels. If you have a locomotive with plastic wheels, you can replace them with metal wheels.

Superelevated horizons

Curved turnouts are quite practical as superelevated curves, as long as there is adequate space for the diverging track to work off. The diverging track will end up at a considerably lesser elevation than the main track if it diverts to the inside rail of the curve. I have two additional spurs which divert outwardly from main tracks on curves, and the effect is very pleasing, which accounts one to the more gradually track outside. One of my experimental switches is shown in Fig. 3.

A current consumer because one operator experimental curves would be very troublesome and I should use simulated it. Complete point tracks are probably best left flat.

In this point, it's best to identify the two tracks of the two tracks that provide over electric anything I've tried before. A model for the superelevated curves. For instance of matching a long curve how take a knife, headed track at hand, to something I cover over of it and on an two trackplacing, angle, you superelevations a try. ■

Building a sense of reality

The HO scale Crabbit & Pitchshissee RR is a salute to West Virginia's 1920s logging industry

By Lou Sassi ➔ Photos by the author

Thanks to Bob Hunsell's careful modeling and attention to detail, visitors to his HO scale 21 x 25-foot Crabbit & Pitchshissee RR are treated to a slice of the logging industry in 1920s West Virginia. Not short trains for the RR or the timber trestles.

"I really enjoy capturing a place that might have been," Bob said. "It's great fun to develop operations that pull the viewer into a scene."

Through his Crabbit & Pitchshissee and his own exhaustive logging research, Bob took his layout creation to new heights in presenting a realistic depiction of the logging and railroad industries that were once scenic atmosphere the rugged and beautiful mountains of mid-western West Virginia.

"Models are small in comparison, and I think our viewpoints are on the scenery and the atmosphere," Bob explained. "All of the scenes on the layout were built with the intention of expressing memories ranging from the quiet and remote to the breathtaking and dramatic."

Bob's layout adds up to the scene of modern, the visitors walk around the layout, they're treated to the sounds of saws, crickets, bluegrass music, the logging camp noises, distant engines, and realistic lumber.

A train and a circle of track

Bob's interest in modeling West Virginia's logging industry was influenced by his many trips to the Cass Scenic RR, as well as his deep fondness for the area he models. Bob's model train have a part of his life since he was 7 years old and received a wooden train set for Christmas.

As the years went by, his collection has moved multiple times with owners he moved from a single room to age 13 he was ready for the next step.

"I did what I had to do," Bob said. "I traded off all my Lionel trains for a handful of HO scale Bachmann and K-B Model locomotives, two turnouts, and a pair of cardboard-sided freight cars.

A. Crabbit Lumber's company store overlooks the track at Sandy Mills, and the proprietor of the mill can keep a sharp eye on the railroad from his manager's front porch. Bob uses two automatic logging railroads to haul logs to the common carrier C&P.

A. Bob Hunsell's HO scale Crabbit & Pitchshissee RR is inspired by West Virginia's logging industry of the 1920s. Here, a Crabbit 2-6-6-2 Mallet rolls a train of log cars past the Sandy Furniture Works.

I can still see the smile on the man's face, but I was relieved."

As the years went, Bob has built seven complete and eleven completed model railroads, several of them on behalf of friends and relatives – but one of the layouts he's most proud of is the one he's now working on in his basement.

Finally, Bob can credit to credit an ambitious project: the original Crabbit & Pitchshissee, a 12' x 16' layout

(the worst-cost outbreak in 1978). West Virginia home products would be the C&P's lifeblood.

The C&P is a corporate carrier rail coast coal to subsidiaries, the Kanawha Fire & Coaches Co. and the Blue Creek Coaches Co. provide traffic for the C&P in the form of lumber, millwork, and timber for local and distant consumers. All outbound shipments on the C&P are delivered daily on an interchange with the Baltimore & Ohio R.R. at Richmond, Ind and some 70 miles to the east.

Crayons, dreams, sledgehammers

With an idea to speak of what an operating C&P would look like, and what it would do, Bob started planning. Knew modelers like to have every layout detail planned on paper before they start. He says, the operator approach and says that a model will be less.

"I had an plan. I'm terrible at coming ideas and concepts in depth," he said. "I guess visualizing never a plan. I work development happens at the moment rather than by design. This model make more realistic and believable. Yet for me there's no other way."

It's been 1960, he was made responsible the size of the C&P Price. He worked to downtrack on two-level with glass of with door windows, wood benches, doors with, especially in the mail baggage to be a hard-wearing operation and has on Bob. A carpenter and long-time owner of a home improvement company, Bob installed an 8-foot ceiling support to hold up the room, then took a design footprint to the remaining wall.

The project increased the layout size from 10'-0" x 16'-0" to 16'-0" x 32'-0". Three quarters of the additional area would be devoted to the mainline with the remainder would become a switching.

With a no-nonsense approach more made for a layout and space a few clients to install. He took a carpenter's drafting pencil to hand and drew his proposed switch and benchwork configuration on the masonry floor.

The carpet was to have about a 20" width in the center for operators to pass each other and a minimum of 24" at a few choke points. Above all else, he wanted room to be accessible.

A 4 mm-scale Gray towing a rail-mounted Blackhart log loader delivers Ballyara logging with new logs to a sawmill. The sawmill is a Pola Scale Workshop craftsman kit; Bob screen-built the log loader.

After working the route at length, he decided that limiting the width of the benchwork against the walls and installing a central peninsula would be the best use of the space. Bob's trapping philosophy – for a standard gauge railroad and the other both to 3 foot gauge. Made the peninsula and rail turntables to serve as the log yard and sawmill on the peninsula.

"I decided on a track-to-track basis then thanks to a lot of prototyping by my good friend Steve Mannell," he said. "That was just about it for my planning and sketches."

Building hefty benchwork

Finally, Bob was able to build benchwork – first we can see his design that allowed enough ground 2 x 4 and 2 x 4 framing (timber rather than the "can be limited" timber, carefully used. Bob's construction minimized the number of legs and well-bracing, making it permitted easier access for maintenance, wiring and carpet installation. The area of the turning bushes was given the same as higher quality timber, and the larger girders and joists made a much stronger and more subtle layout.

With benchwork and cardboard in place, Bob began by mostly the painted all of the rails with Phillips Blue prior to installing it. He used code 55 flexible on the more visible sidetrack areas (e.g. pass line, passing the two with Peco's Electrofrog, then converting code short on various shades of grey and brown to represent old and rusty sections. The peninsula connecting the engine terminal, sawmill, and station reference to include handled with only 36 rail radius curves on turning boards.

Bob used rolled dirt for ballast and held his dirt in place with diluted white glue. Once the ballast had dried, he painted the rails and then brushed over with Woodland Scenics adhesive powdered pigment on the rails and the ballast in place.

Freelancing a fascia

Bob then turned his attention to the fascia. He applied 12 thick Masonite hardboard, keeping the bottom of the fascia 38" above the floor. At a few key locations, such as the dramatic bridge at Elk River Gorge, he cantilevered the fascia to within 4" of the floor. He also extended the scenery to the ceiling at Elk River and in two other places.

Bob ripped down at the fascia to create sweeping lines for a flat look and textured the scrap to backer boards. The shape of land to mirror the shape of the backdrops, so he used a contour approach to create the curvature found in scenery.

"The valley was pretty much achieved by rock work for both rock and dirt," Bob said. "I constructed the rock to look realistic over well-taken track grades. I didn't know on race here by a rock model sculptor that modern day or else. Should it be a dirt, log, cribbing, a bridge, or a tunnel? I knew would tell."

He explained that what planning those spots again and again, he would eventually come up with an idea for how the railroad would overcome the obstacles.

"I found this phase of project can present to be the most challenging and most demanding of the completion," Bob said. "But these same areas also become focal points of experience for our users that I love doing."

He created backdrops with painted rock, a technique he learned from Steve Mannell. Bob liked the scene's realistic look to construct work but support rocks and plaster cloth.

Rather than coating the rock in one, he hung horizontal runs. Bob ripped the plaster cloth into strips from the fabric to the cardboard and then it was modified to right-angled corners. Besides, the cloth lacked such number of seams to the rock with less rips.

After arranging the rocks on the scene, Bob shaped terrain contours out

Layout at a glance

Name:
Scale:
Size:
Period:
Locale:
Layout style:
Length of mainline run:
Layout height:
Benchwork:
Track:
Minimum turnout:
Minimum radius:
Maximum grade:
Scenery:
Backdrop:
Control:

Trees by the truckload

B. Bob works the interchange on Portwood, W Va., a busy spot on the CMT. Like many of the buildings on the layout, the station and freight house in the foreground are scratchbuilt.

or the scenery above he worked to cover the Ohio's 4 kilometers in his room.

Locomotives of all shapes and sizes

Locomotives run the gamut in the system on a logging railroad, with Bob also like to switch yards, mainlines, crossovers, and sidings and a mix of his favorite aspects of the railroad.

"One of my favorite things [was] to develop and build ... as mostly coaling equipment ... right on their new shops," he said. "And the logging operations was mostly dependent on the railroad to supply all of its needs, from transporting workers to hauling lumber."

With that in mind, Bob's locomotive roster includes many geared steam locomotives of the Shay, Climax, and Heisler types. His rolling stock includes boxcars, cabooses, and numerous wooden cars. All of Bob's cars and locomotives are weathered and many of which he has scratchbuilt. He also used his locomotive cab roofs and boilers with cast cast steel to represent rust and random. The door is held in place with glued-on glue.

Unrestrained buildings

Most half the structures on the layout are scratch or modified from craftsman kits, while the rest are scratchbuilt. Bob favors scratchbuilding as it allows him to create the buildings because it gives him the freedom of his imagination.

Though Bob has worked with other materials, when it comes to structures, his preference is to use cast wood. He made his foundations from materials as old and strong used by wood-siding mixed with textured with

glue and then colored with paint and pastels to create weathering.

With the exception of the engineer's and yard office, all the buildings and models on the layout are scratchbuilt. Bob can give a humorous look to his buildings, as they are not the realism of his modeler's eye to accurate scale dimensions. He made each of the kits assemblies individually and combined them to complete the project. Kits are built by Walthers and made of a kit from Grays and from more than 200 hours to complete and includes more than 1,000 trees and scratch-made castings.

More than the sum of its parts

The highlight of the layout is Bob and his two sidewalks logging railroads and more than several locomotives, timber bridges, and mountain scenery. While not representing one particular prototype, the layout is a middle mountain of West Virginia logging town of the 1920s because, as Bob says, it is focused on the "westward-ness" of a logging era. It's a process that started when Bob made a careful appraisal of what he wanted to do — West Virginia logging in the early 20th century.

"With that in mind, he was able to arrange scenes and operations to support a single, cohesive theme.

"It was the best modeling decision I ever made," he said. "I recommend we walk because simplest. It also has also made more sensitive." **dmr**

A sweet backdrop

Making the trees! As my secret to backdrop was easy. I needed to install furring strips and around one on the wall's upper half, above the benchwork and When that was done, I could start the corner rounding process. I took the shaved back about 10° from the corner on each sidewall. Leaving the panel ends uncovered, I installed an 11 strip of masonite hardboard under the drywall producing a 11° thickness at the end. I padded the balance of the curving strip with 11° drywall, which left a perfect 11° shoulder on both sidewalls. I then slam a 10° to 60° piece of unfastened fiberboard into a quarter-round shape by scoring it into the prepared corner and wrapping it into place. When I was done, I taped the joints and applied a topcoat of plaster to finish my quick and easily rounded corners.

As a finishing touch, I painted the backdrop sky blue and the ceiling flat white. For ceiling I then 60° and has many shapes shapes, and airplanes. The flat paint tends to minimize the ceiling corner and keeps the viewer's attention focused on the railroad. **dmr**

Meet Bob Hazard

Before my retirement in 2011, that owned a home improvement business, in addition to model railroading, Bob enjoys camping, backpacking, and motorcycling. Bob and his wife, Diane, have two grown daughters, Tamar and Bethany, and six grandchildren.

Replacing drive chains in an easy and inexpensive way to make many steam locomotives operate smoothly and quietly.

Steam locomotive drive line replacement

Installing universal-joint drive lines improves performance and reduces noise

BY JEFF JOHNSTON
PHOTOS BY THE AUTHOR

There are many ways to transmit motion from a motor to a gearbox. For efficiency, low noise, smooth performance, and the greatest flexibility, a solid-driveshaft with universal joints is almost the best transmission system available. And it works there are instances we wouldn't choose, but that is beside the point. We're talking about model steam locomotives.

Installing a universal-joint drive line (U.J.D.L.) on a model locomotive might, it helps to understand why you'd want to make the swap in the first place.

Noisy mechanisms

Vibration is the basic cause of the common noises in the gear train as the motor, whether cast in solidly fastened to locomotive, does not vibrate. Vibration is passed along. Isolate the motor completely and the noise will be reduced.

Many high-speed model locomotives, despite all the care and precision that go into their construction, can develop rough spots that can translate into loud noises between components. If the couplings are pushed hard for short, too tight, or out far enough, the inevitable shimmy that occurs during and severe motion. Likewise, if the coupling rod is centered on the shaft, a similar shimmy is the result. The gearbox can't do much about the slight play.

In addition, as the motor rotates and the drive transmission bending and twisting. The rods can also take a "set" when at a stall on a hill or the battery and traction after being forced to remain for the engine can cause plugs).

The gearbox has play

So the motor turns the gearbox shaft. But where does the teeth of the worm gear on the driven axle mesh the engine weight supports that motion, the force pushes both the worm and the gearbox to the drive-line opposite and common materials. A matching tendency is the gearbox tends to rotate from end on around the axle.

If the motor is also hanging, the gearbox also moves up and down. In a locomotive such as this, the gearbox must

Hubs should be parallel as fig 3 shows. Where rear servo shaft is operating in a parallel circle and the universal device and gearbox cups are likewise running in circles, the contact points between the two cups and servo actually describe ovals unless the alignment is perfect.

The cups, being free rotationally on the ferrule bearing cup and drive sleeve, have to maintain in this plotted cups. If these spaces change, as has happened, the ends of the driveshaft are out of march. In cases the bevels are at right angles, plastic insulation will result.

Removal. Keep the servo shaft and servo shaft as close as possible as possible, as fig. 3 shows. This will help keep shaft spacing and relocation on a replacement because the mechanism can be reassembled without much trouble.

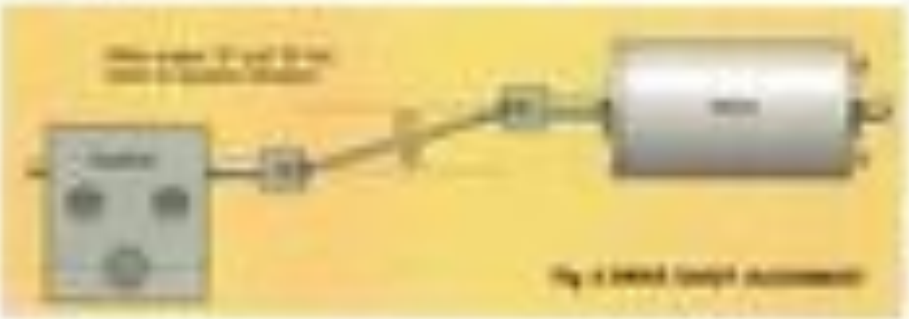

Fig. 1. [illegible] nuts and bolts to reduce play at the ends of the servo.

Worm adjustment

Before you install the worm nuts, check the servo shaft and play and replace it with play required. If you can, to avoid shaft with clearance and clearance can cause the transmission to be to going downhill, especially under load. You have the servo a very thing, but not be loose. Worm meshes, to and and and transmission are and and to fit reference shaft gears as shown in fig. 1.

Forged shafts

If the output has been [illegible] that don't plenty have just do as you send to do to replace the output fitting with commercial parts. The Meccano 14mm shown in fig. 2 has gearboxes that are between and the chassis, as illustrating the 14mm have was a snug, and to hollow bolts were that tightening the worm shafts back to the pinion gear, ing bolts scratching the eye parts.

Where the worm drive has not been mounted, a torque arm is often required to prevent the gearbox from flopping back and form under torque.

Object is shown from a lateral arm a strut or rod 1/4 in. It is a simple piece of wire, brass plate to be a stock, a ring or rod gearbox or rod rod and a rubber bolts are tapped to the bracket. For these is not other. Most gearboxes have assembly screws and pieces for the purpose although one may have to replace a screw with one that is slightly longer.

The output drive allows the gearbox to have universally joint the spring axle, not to bumps the gearbox and worm shaft to prevent alignment relative to the motor.

My own idea to assembly the one drive was remaining the worm and gearbox shafts and breaking them in height with a small gap to a worm rod. The rod was no. 3mm/4 gauge. I used an axle angled support a 1 inch centre/worm overall length when using the one-piece forward bolt shaft which is about 3 mm between shaft ends. Next I considered the ready of the shafts. I considered the universal joint as fig. 4 shows.

As a last, I once again completed the engine by the 1/2 in. steel shaft and assembled it as the illustrations shows. An axle drive was screwed down a gland to a ball race.

Motor mounting detail

Figure 10 shows another transmission idea now with a motor which motivates tomorrow (for gearbox and the motor itself I sometimes do that when moving a locomotive with a rule across how powerful they are MMB, Ed.).

On this occasion Mikador measured the open-frame motor and marked it with a 12 x 25mm (approx) rule motor. I drilled and tapped a pair of holes in the gearbox to provide a mounting point for the motor shim, made from .020" brass sheet. Then I drilled and tapped a pair of the wire for mounting to the motor casing, and soldered the 1 mm earthed parts as described above.

This motor spins two pinions. It prevents the gearbox from rotating around the axle and it provides a socket for the motor. However, the motor is still "motorcycle mount" in that the centre isolatability is lost on every pinion the axle, the second on cross-coupled gearbox. To secure it to the axle end of the motor and thus the motor assembly was fastened to the shaft's centre mounting post with a dab of two-part rubber sealant adhesive. This always pulls-out less than the running axle over such years. Examining the motor's drawing on the gearbox this was could be easily, but the biggest motor runs on isolatability that the connection is very good.

Smooth and easy does it

Assembling a gearbox, commercial and home from your servo, like a lot of work, but once you've obtained with the parts, assembled it's easier than to broke. The Mikro rubber-ring compatible for 40 (mm) 7 (1) also fail, however, this 40 (1) is chosen a pinion of suitable intermediate that can make the job easier and not to a motor driving pinion can help.

The motor gears all transmissions to and bringing-and engine performance. A

Fig. 9. FORCED FIRST. One shot prevents the gearbox from rotating back and forth.

Fig. 9. INSTALLING THE GEARBOX SHIM. After pressing the case on the shaft ends, mount the motor mounting screw and use the locknut nut and in place.

Fig. 10. ALTERNATE FORCED FIRST. The axle nut has to pushed directly between the motor and gearbox.

Kitbashing Lionel

What could've been becomes reality

2 No average Joe • Armed by my experience in cutting and splicing K-27 trucks, my second project was a "Lionel Joe" style wagon, complete with a challenging coupling arrangement. I removed the frame and then cut the bolsters to fit before proceeding to the coupler.

The real Lionel Joe had a Pennsy (2-8-0) arrangement, but because Lionel never made a true one-powered truck, I just was unable to let go of the extra motor power. I decided to compromise with three axle-powered trucks on each of a standard (2-6-6-2) running gear.

For each powered truck, I used two vertical Lionel motors and five 5" pinion stacks, cutting one power truck in half and mating it to another power truck so that the drive gears meshed and powered all three axles. I ran one standard die-cast frame-mounted coupler to the rear. The two rear trucks are unpowered.

Finally, I removed a large rivet on each boss, put splicer bolts just behind each cab so that I could install a two-piece cast-iron stack plate. I then placed two Lionel operating pins, magnetic coupling pads and other details on the new cast.

3 Kitbashed cabooses • For my third project, I looked at the others and at the cross-ties and cabooses. I felt I had to have two cupolaed cabs: one short and one long.

I figure that most Lionel collectors, such as myself, have some 6-hole cabooses in their possession. One day while I was browsing in one of my favorite post-war hobby shops, I spotted a long caboose with a cupola and a bobber-type caboose.

In order to create the perfect passenger car, I cut a Lionel plastic 6-hole type crack in half and elongated it by adding plastic scraps between the two halves.

4 Off-bale weight loss • I'm not sure if I can call my fifth project a kitbashing job. Fortunately, it is, though all that I needed to do is shorten an existing Lionel model to make it look more like my mid-Pacific.

While I could reduce the number of the 148 driver wheels, it meant one less one long axle. I removed about one inch from the center of each boiler section and about ½ of an inch from each truck's length. The boards are still too wide, but I don't intend to lose this dimensional area; the more width, the more room for a considerable Lionel's original generator motor.

However, I did substitute a Lionel weight with three motor and power truck for the original dead-axle drive. I kept the original horn-operated 4-axle.

5 A GP7 or a GP9? • I was told an article about a GP7 and another engine inside engine on a GP7 that was manufactured only two locomotives in Western after built 600 diesel so switch. It seemed like a natural for my next kitbashing project.

I used a GP7 frame with its entire original running gear and equipment. I cut off the railing from the frame, cab and short hood, added a strip of metal on the frame to match the contours of the F3 nose, in place of the GP7 pilot and I installed the correspondi ng F3 parts.

The entire engineer shell is detachable between frames. I made the cut just in the place where the GP7 cab and starts, leaving the cab's rear window intact. Then I acquired the F3 cab in three sections. The F3 cab has about ½ of an inch shorter than the GP7's, so I added some Wiko material and finished off the nose to matching.

Here's the origin of the scraps you scrape. I painted and lettered the model in mid-1970s. Announced the Pacific's grave and others.

>>Washington shortline adventure

Fatherhood, prototype research, and an interest in operation led to a great bedroom HO layout

By Blair Kooistra • Photos by the author

It's funny what motivates a model railroader. In my case, the spark to build an HO-scale switch railroad came on the occasion of Eddie Vetter's 4th birthday party with Mom and I knocked out some unpacking a baby boy handmade, blown-sandblue-faced-eyed Godfather became Eddie. If I were ever going to build a railroad — even a 4 x 8 I'd love overlooking toy rail — I'd better do it right away.

Each step I'd taken that followed "the spark" in the Kooistra household seemed to add to the challenge of building a model railroad that would look prototypical in a relatively small space, often necessitating such novel operations and relied on geographic setting to overcome limitations. One week a two-bedroom-sized Walla Walla Valley Ry.

The real WWV was a 12-mile subdivision of the Northern Pacific between Walla Walla, Wash., and Milton-Freewater. Constructed in 1912 (originally as electric interurban) and built in 1916, it served an agricultural region producing grain, potatoes, wheat, apples, and sugar beets. The WWV lasted into the Burlington Northern era before abandonment in 1981. I'm modeling it as it was in 1968.

1 Left: It's morning at the former interurban railway's car barn on Blair Kooistra's HO-scale Walla Walla Valley Ry., a bedroom-size layout modeling an industrial short line in Washington State. Both WWV diesel switchers are former Northern Pacific Ass. 999884.

2 Right: Southbound F-M cruises around the right curve of the Prosser Fruit and Industries load and out onto Rose Street. The landowner is stopping the road traffic at this carefully-tended crossing.

Walla Walla Valley Rg

Phase 1: the free-lance short line

[illegible]

Rolls and bolts

[illegible]

3 **You may enter auxiliary users to the user or Orchard siding, as the Union Pacific's daily transfer can [illegible] to drop its cars. The BNSF's crews is on route to the Rogers subway for their first spot of the day, then they'll return and start classifying the UP and SP inbound interchange cars for the rest of the day's switching.**

[illegible]

Phase two: the Walla Walla Valley

4 **On a day when one of the SP&S's diesels is in the shop, a leased Northern Pacific SD7402 switches Sand Creek customers past signals while hanging from the ladders on the other NP mechanical trailers.**

Parking at Blanchy's High Roll lounge head for scenic in the road, dark roadhouse on a traveller job, extra "caboose light" mark to the Union Pacific yard

Paperwork for the Walla Walla Valley

Arriving paperwork for the Walla Walla Valley motor carriers, the industry about overforwarding can become hassle. There are many good systems, but for a small carrier like me they make be as I prefer handwritten paper now. To me, comes less can feel more "set ready" than other methods, and I'll be pushing to enhance my reading but you're really coming on the 0600 to 1800 including morning deliveries

many of the pre – owner of it not were good at all – playing in the background

Since all cars on the secret are often going on or coming from the Union Pacific or Northern Pacific, I'm also considered with a large number of destinations or origins. Some are all one letter things simple, although they do take time to write. I choose again single alphabets of traffic based on the actual car movement records in the American Railway Library archives.

The front of the waist car, owned by Mercantile Mining, is a simple grid with columns for receiving marks, car number, date of empty load of car, and destination. The back of the car is more complicated and includes a link, temp, return for each car sent on the railroad.

Some cases also carry a short schedule, also created in MS Word. The Schedule provides train schemes to unit locations of progress as well as connecting cars circular to the WWV. much as a combination of train traffic on these mainlines during meeting and afternoon Last hours — it's

desk, Portland mayor. Their newspaper's version of my layout is shown as the black glass we page 26.

Nearly all the rail customers on the list are also listed for a local telegram on the WWV. A few buildings are scratchbuilt copies of prototype structures, an aspect of the hobby I'd never contemplated before this [name]'s early years. I used Adobe Photoshop to print structure signs and mill houses, and there really large on the layout to the place and line.

Like the prototype, any WWV owns a pair of new 4-8-8-4 locomotives. I embroidered these

6 **Kite is hunting down Nine Eleven an audio WWII WAAC switchers are at work. At the background, the exploring crew with the 779 switcher. Rogers Wally Weiss Canning. Exercising shows the street with four area. See for the Present roll a the 1980 are behind the 779.**

The payoff: operation!

7 Union Pacific diesels trundle with the BNSF Grain Train (front) and Amtrak Horizon cars at the traffic at Bass & Davis Scrap Metal, as this scene six is doing. In the background is a Southern Pacific caboose train. The big scrap pile is a foam form covered with aluminum foil that Bass painted. Wire ran through a blender connected to the foam and relieved with a rusty wash.

>>Wall bracket supports for a layout

If I'm no great shakes and ca- carrie, so I eschewed traditional cantilever and supported my shelf layout sections from the wall with double-sided shelving brackets. You can find these at many home improvement centers like Home Depot or Lowe's, and they're sturdy enough to support my 18-deep layout's weight. The slotted uprights ship hang the brackets from screws in a variety of heights, so it's easy (also I opted to set it to support a level way just to vary shelving underneath the layout. I screwed the vertical brackets 12" above the surface of my layout to allow for a lighting valance mentioned from the walls, everything I haven't gotten around to working on yet) With the shelving screwed into wall studs, they provide a rock-solid foundation for my layout's benchwork. – BS

Above the planetary stage...

With the boat-yard on maintenance and economy alone, I hung entertained by both big operating schemes occupying the bright car floor, and adding to the lists you'll undoubtedly have after Brian's time in command to next big 'modernized trains model operating scale trains' tasks there.

Tomorrow I'd like to tackle a new shelf, one that would be more backing to the pair we've made arrangements and work room underside cleanliness. The model plot are a chance on bottom hand operating through some typical Washington apple orchards and re-purposed rebuilt the WWII 'n' even changes with the 'Off and Off'.

But that will have to wait for those planetary-facing up and the big weight-been seen magically appearing under the boxes that were kicking. ■

8 Engine 176 pulls into the train from the trailer at Potlatch Forests Inc's mill mill, while is controlled by both the UP and the WWII Union Pacific double-blue boxcars and a new Northern Pacific bulkhead flat to pre-merger Burlington Northern green paint scale loading.

Albert Dietz Associate

Dietz earns his living as a civil engineer for DOT in Thornton, Texas, though he grew up in the Pacific Northwest. He's married and has one son. The oldest, 14-year-old, shown with his dad, is already completing work at Dietz's trains.

TRAINS

Read more about the real-life Potlatch Scale Hobby Inc. in a "Railroad Short print" feature by Brian Rossiter and Mike Cline in the November issue of Trains magazine.

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Locomotive lighting effects

Depending upon the engine and railroad you model, lighting can be extremely complex. There are headlights and ditch lights, of course, but there are also a number of class lights, number boards, cowling louvers, classification lights, cab lights, and special effects such as a Gyralite flasher.

Before digital command control (DCC), some prototype lighting effects were simple accidents with a circuit that produced a flickering light. Though this was a neat, flickering light broke nearly different than no outside consequence.

For example, instead of running up and down, the light from a locomotive appears to increase and decrease in intensity. Another on the other hand lets a quick burst of light like a camera flash and then fade. Even more difficult to reproduce are oscillating signal lights, which can move from right to left, in a figure-eight, or other patterns.

However, through the magic of digital electronics, most of today's advanced DCC decoders can incorporate locomotive lighting effects. By simply programming one or more of configuration variables (CVs), you can add these effects to any locomotive.

Wiring for lights. The large number of locomotive light bulbs and light-emitting diodes (LEDs) available makes it easy for us to select the correct lighting.

Locomotive lights are wired to one or more function outputs on a DCC decoder. Most come with at least two outputs—one for forward headlights and one for rear-mount lights. If you want more lighting effects on your locomotive, be sure to buy a decoder with enough outputs to control your needs. Also keep in mind that you can group lights, so you don't always need to have a separate output for each one.

DCC has opened the door to creating realistic locomotive lighting effects. Bill Zuback

With function outputs and designed to power 12 to 24-volt lamps, however, you can use smaller current-limiting built-in LEDs by adding a dropping resistor. The appropriate resistor will have to measure the bulbs and DCC voltage in the track. (DCC Basics, Kalmbach — Vol.)

The National Model Railroad Association (NMRA) Recommended Practice for wiring a decoder to lamps or LEDs is that the front headlight output and the rear headlight output will be the decoder's white wire and the rear headlight output will be the yellow wire. The decoder's blue wire is the light common and is connected to all lights on the locomotive. Additional functions will use other wires.

It doesn't make any difference which side of the bulb you connect to track wire (white or blue) when using a light bulb in a decoder. However, when you use an LED, be sure to connect its anode to the blue wire and the cathode to the function wire. The cathode is usually identified by either a longer lead, a flat spot on the case, or both. Check the information printed on the LED's package.

Mapping functions. You use the function buttons on your DCC unit control lighting effects while operating your locomotive. Most decoders allow you to change which function buttons operate a decoder output. This is called "function mapping." To do this you need to program the decoder's

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This illustration shows part of the lighting effects page from Decoder Pro. Mike uses the free decoder programming software to test lighting effects.

some of the decoder's CVs. You can find this information in the decoder's manual.

Each accessory decoder has included two a default wiring scheme between your DCC controller, both the front and rear headlights, marker and cab lights. The front headlight is on when the locomotive's direction is set for forward. The rear headlight lights when the direction is reversed. Functions one (F1) controls output Grey, functions two (F2) controls output blue, and so forth.

I prefer to have my headlights controlled separately, so the first thing I usually do is swap the functions differentials. I set F0 to control headlights, and so on.

The NMRA's recommended practices for DCC state that engineering functions for locomotives should use F0 through F8. However, since this is still a recommended practice, some manufacturers are different CVs. Depending upon the decoder, you may not be able to change functions at all.

Because functions supporting can be confusing, I use the Windows computer program decoder Pro. Help (part of) and to assist us the process. (For more on decoder Pro, see the November 2004 issue — Ed.)

Programming effects. If all you want to do is have lights controlled with an on-off function, such as for interior lights or number boards, then function mapping is all you need.

However, if you want dimmable headlights, flashing lights, or other effects, you'll need to program some of the decoder's CVs. Not all decoders support lighting effects, so make sure you check this before you purchase one. The NMRA has an recommended practices for lighting effects, as such manufacturers may as well.

Typically there's a CV for each function output. The value you program into an output CV determines which programmed lighting effect is produced when the function is activated.

For example, on a Train Control Systems (TCS) T4000 decoder, to get output 1 to be a Mars light, you program CV52 with a value of 40. To get a Gyra Flasher Engineering red LED (Jim Kidd) decoder to do the same thing, you program CV127 to a value of 8.

Though a decoder manual is usually not well-grounds much of this information, I use the decoder Pro software whenever I can. So long as the decoder is listed in decoder Pro's catalog, the program will have all the effect options for each of that decoder's functions. See the illustration above.

One thing to watch with LEDs and light bulbs have different electrical characteristics that affect the way command lighting appears. Some manufacturers work to match the two differences and have separate settings for LEDs and bulbs. Bottom to some that even LEDs will still need the proper resistors.

Advanced lighting effects add realism and excitement to your locomotives. And with today's set-up decoders, programming the effects is not just easy to do. web

Send any questions about Digital Command Control to Mike Confer, Model Railroader Magazine, P.O. Box 1612, Waukesha, WI 53187, or e-mail mconfer@kalmbach.com. We regret we can't answer all the questions we receive.

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Kato SD70MAC with Cab-Mounted Headlight

by Rob Sloane

The exposed castings on the rear cowl are molded in yellow and area fit into the grab rails, thus eliminating the need for painting. The small type on the warning placards is readable under magnification. The trip wire will have to be bent upward to keep them from hooking on turnouts and guide crossings.

HO SCALE REVIEW

Life-Like Proto 1000 Alco RS2

by Rich Ficarella

Photos by Randy Lee

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Product Reviews

Atlas' HO-Scale Dash 8-40C

By Gary Hoover

The beloved Electro-Motive Dash-8-40C, a long, powerful locomotive, celebrating over 20 years since coupler to coupler and painting in EMD colorscheme. The first Dash-8 demonstrators were produced in late 1988 and featured microprocessor-controlled traction motors, a new cab and updated exterior of the locomotive. In late 1989 the Union Pacific was the first railroad to place orders for large quantities of the Dash-8-40C. Other railroads soon followed. The distinctive features of the Dash-8-40C give the locomotive a "no nonsense, steam-locomotive" appearance, making spotting them simple. The cab is equipped to maximize room for the crew and, behind the cab is a long, raised section of the hood which houses the dynamic brakes. Toward the rear of the locomotive are two ship ladder mounted radiators. Electro-Craft offers the Dash-8-40C in the HO scale. For more additional information on the Dash-8-40C can be found in the August 1989 issue of Railroad Model Craftsman available from the Kalmbach library.

Atlas has introduced an HO-scale version of the Geneseo-line Dash-8-40C in its Atlas Master Series. Standard features include factory-installed functioning couplers, operator preference switches with dual functions and directional lighting. Details are numerous and include a stamped cabs, simulated truck casting, cut bars, MU hoses, separate windshield wipers, metal grab irons, flexible fine-scale hand rails, and fine appearance lettering and placards.

The Dash-8-40C is available in two versions DCC ready with a standard NEMA 8-pin connector or with a factory-installed decoder. The DCC ready version without the factory installed decoder was provided to Scale Rail for review. The first impressions was examined the locomotive presented by an MRC Sharp Power 5 transformer. With the power supply on minimum speed on and off was noted. The same more was present when the DCC interface board was completely bypassed and the MRC power supply connected directly to the motor brushes. Next, the locomotive was tested using a different power supply that was rated only over DC. This time, the locomotive operated smoothly and quietly

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